

PART V

Dealing with the data

A central, usually indispensable, part of a typical real world research project is the collection of data. No data – no project. In library, desk-based, projects someone else will have already collected the empirical data you discuss. Hence, much of the material in Part V is still relevant. How did they deal with this data? Do they give you sufficient information to evaluate the adequacy and appropriateness of what they did?

The specifics of data collection are bound up with the different methods of investigation. Whatever methods are used, there is a need for a systematic approach to the task – a need probably, paradoxically, at its greatest in so-called ‘soft’ methods such as participant observation and unstructured interviewing. Once you have data, the next steps are analysis and interpretation.

Collecting the data

Collecting the data is about using the selected method or methods of investigation. Doing it properly means using these methods in a systematic, professional fashion. The chapters in Part III covered the issues raised in the use of specific methods. At this stage you need to ask yourself the following questions:

Have you explored thoroughly the choice of methods?

There is no general ‘best method’. The selection of methods should be driven by the kind of research questions you are seeking to answer. This has to be moderated by what is feasible in terms of time and other resources, by your skills and expertise and, in commissioned research, by the predilections of the sponsor.

What mix of methods do you propose to use?

The virtues of multi-strategy designs and the use of multiple methods have been emphasized in Chapters 8 and 15 respectively. All methods have strengths and weaknesses and you are seeking to match the strength of one to the weakness of another and vice versa. If

it is impracticable to use more than one method, don't worry – many studies are still mono-method. Don't give up too easily though. It is often possible to devote a small fraction of your effort to a complementary method. This might be an unstructured interview session at the end of an experiment. Or, perhaps, two or three mini case studies based on observation, interview and document analysis – linked to a questionnaire survey.

Have you thought through potential problems in using the different methods?

You don't choose methods unless you have the skills and personality characteristics they call for (one of us would pay a fairly substantial amount not to have to do a telephone survey involving 'cold' calling). Nor if they would be unacceptable in the setting involved. Nor if they raise ethical concerns. Pilot work almost always brings out problems; better then than in the middle of a fixed design study.

Do the methods have the flexibility that you need?

You don't do fixed design research unless you have a clear idea about what you are doing before the main data collection starts. If not, you use some type of flexible design. The methods themselves in a flexible design study need to have a corresponding flexibility (e.g. relatively unstructured observation and interview). This does not preclude moving on to a confirmatory phase, using more structured instruments, at a later stage of the study in a multi-strategy design.

Whatever methods you use, data collection calls for commitment

You have to care – both about the substantive area and about your responsibilities as a researcher. This dual commitment is crucial. Caring solely about getting answers to the research questions, or about 'helping' the participants in some way, you are in danger of losing objectivity and the ability to appraise the evidence fairly. Caring only about doing a good piece of research may lead to the degree of detachment rightly castigated by feminist methodologists. And you need high commitment not only to do a quality job but also to get you through the inevitable bad times while you are doing it.

Analysing and interpreting data

After data have been collected in a project, they have at some stage to be analysed and interpreted. The traditional model in fixed design research is for this to take place after all the data are safely gathered in. It is, however, central to flexible design research that you start this analysis and

interpretation at an earlier stage of the project. Analysis, at whatever stage, is necessary because, generally speaking, data in their raw form do not speak for themselves. The messages stay hidden and need careful teasing out. The process and products of analysis provide the bases for interpretation. It is often the case that, while in the middle of analysing data, ideas for interpretation arise (which is a major disadvantage of relying totally on the now virtually ubiquitous, and immensely useful, computer packages for analysis of quantitative data).

Analysis, then, is not an empty ritual, carried out for form's sake between doing the study and interpreting it. Nor is it a bolt-on feature which can be safely not thought about until all the data are collected. If you do this, you are likely to end up with an unanalysable mish-mash of quantitative data which no known test or procedure can redeem. Or a mountain of qualitative data which keeps you awake at night wondering what to do with it.

Hence, *as emphasized in Part II*, thinking about how the analysis *might* be carried out forms an integral part of the design process for any investigation. A particular disposition of your resources which, say, gets more data from a smaller number of respondents or fewer data from a greater number of respondents, might make all the difference between there being a straightforward path of analysis and a highly dubious one. If you have thought through such an analysis, that is available as a 'banker'. You can then, with confidence, explore the data when they are in and see if there are alternative or additional messages you can get from them.

The intention here is to sensitize you to analysis issues and to cover a range of ways of dealing with both quantitative and qualitative data. *Our aims are primarily to set out guidelines and principles to use in selecting appropriate procedure and to discuss how the results obtained from these procedures might be interpreted.*

Little attempt is made to cover computational aspects. The advent of powerful computers and wide-ranging program packages on statistical and other procedures obviate the need for factual knowledge about formulae or for craft skills in performing complex calculations. No doubt, inertia in the presentation of courses, and remnants of the puritan ethic, will force further generations of students through these satisfyingly labour-intensive hoops. However, there are more profitable ways of spending your time than doing something which a computer can do better, and more quickly. This does not gainsay, as mentioned above, the value to interpretation of really getting to know your data by playing about with them. And this is also something with which the computer can help.

Realist analysis and interpretation

The realist thread running through this text has, as its prime focus, the search for mechanisms. Taking a realist stance has many other implications covered in earlier chapters, but seeking an answer to the question behind almost all research of 'How can I understand what is going on here?' (in terms of 'What mechanisms are operating?') is central.

Once the task has been conceptualized in this way, it is not difficult to provide some kind of interpretation in mechanism terms for most if not all research projects. At issue, however, is the convincingness or plausibility of the operation of the proposed mechanisms, which depends partly on the design of the research and partly on the findings.

The work of Pawson and Tilley (1997) discussed in Chapter 2, p. 31, and at several points in the text has formed the basis for a wide range of projects and their analysis. Carter and New's

(2004) edited volume on *Making Realism Work* provides a varied range of exemplars. However, it has to be admitted that realist methodology is still in its infancy and the approaches to analysis in the following two chapters is largely traditional. This is, in part, because of deeply entrenched traditions of both quantitative and qualitative data analysis, and corresponding expectations of journal editors and reviewers. Also, particularly in the statistical analysis of quantitative data, traditional techniques can with minimal tweaking be adapted for realist purposes. This includes de-emphasizing the use of statistical significance and concentrating on other evidence for the importance (i.e. real significance) of findings using effect sizes and other measures as evidence for the operation of mechanisms – see Chapter 17, p. 441.

Why focus on mechanisms? While there may be resistance in some academic circles, other audiences including practitioners appear to find this helpful (see Chapter 2, p. 35). Also, as Pawson (2006) has argued with some passion, a focus solely on outcomes as in the process of ‘systematic review’ does little to develop a cumulative understanding of complex social interventions. Accounts of how they work can reach a better understanding of how theory may be improved.

Preparing for analysis

You have data, whether collected by yourself or some earlier researcher. You need to understand them. Data come in all sorts of shapes and sizes – audio- and video-tapes, sets of instrument readings or test results, responses to questionnaires, diary entries, reports of meetings, documents, etc., etc. Many of them fall effectively into two categories – words or numbers. Or they can, without too much difficulty, be turned into words or numbers. And some features of the words can be captured in numbers. So we have *qualitative analysis* (for words, and other data which come in a non-numerical form) and *quantitative analysis* (for numbers, and other data that can be transformed into numbers). Much real world research produces both and it is important that you are able to deal competently with the two kinds.

Keep quantitative analysis simple

Many researchers appear to think that the more complex the analysis you can do, the better. This is not true. You may be forced to get into, say, multivariate statistics by the conventions in your field or the expectations of supervisors or sponsors and/or journal editors, but fancy methods of analysis are no substitute for thought and reasoning when you are trying to understand and interpret your findings.

Simple descriptive statistics, tables and visual displays of the data are often all that you really need. If you need to persuade yourself, or others, on this point, classic papers by Rosnow and Rosenthal (1989) and, particularly, Cohen (1990) provide powerful ammunition. See also Gorard (2006) who argues convincingly that ‘everyday numbers’ can be used successfully for research purposes without the need for complex statistical techniques.

Seek advice about statistical analysis

If you need to carry out anything more than the simplest statistical analysis – beware. A vast technology on the carrying out of statistical analysis exists and it would be foolish to expect everyone carrying out real world research to have all of it at their finger-tips. There is a tendency to gain some familiarity with a narrow range of approaches and then be determined to use them. This means either inappropriate analyses or severe restrictions on the type of research questions you can tackle (the analytic equivalent of the one-track methods person who tackles everything with a questionnaire). The technique of ‘analysis of variance’, as used by some experimental psychologists, provides a case in point.

A more extreme, though not uncommon, response is to eschew all things quantitative and stick solely to qualitative analyses. Although this may be presented in terms of ideological objection to positivistic quantitative approaches, suspicion remains that there may be other blocks to the use of statistics.

One solution is to get advice from a consultant or other person familiar with a wide range of approaches to the quantitative analysis of social research data; and to get that advice at the design stage of your project, *before you have collected the data*. The advice should also, in many cases, home you in on a computer package which will do the analytical work for you. All this does not mean that you come naked to the consultant’s table. It is important that you have at least an intuitive grasp of the kinds of approaches that might be taken, so that you know what is being talked about. Chapter 17 seeks to do that job. Even if you are on your own with no consultant available (or, as a student the rules say that you have to do it unaided in this way), it will sensitize you to a range of possibilities which, with further reading, you should be able to implement.

You are going to have to do much of the analysis of qualitative data for yourself

The analysis of qualitative data has now, like horticulture, moved out of the ‘muck and magic’ phase. It was commonly held that there was some ineffable mystique whereby the methods could only be used by experienced researchers admitted to the magic circle after a lengthy apprenticeship. Following Merton, Fiske and Kendall’s insistence (1956, p. 17) that this is no ‘private and incommunicable art’, serious attempts have been made to show that qualitative analysis can be systematized and made widely accessible. *These approaches are discussed in Chapter 18.*

However, while there are helpful routines and procedures, they are less technical and differentiated than much statistical analysis – closer to codified common sense. It will undoubtedly be helpful to get external help and support to carry out qualitative analysis from someone with experience in this field. This, however, is more concerned with getting feedback on the processes you are using and checking the warrant for the interpretations you are making. There are computer packages to facilitate the process but they in no sense do the job of analysis for you in the way that a statistical package does.

Analysis or interpretation?

The traditional, and still widely used, terminology is to refer to the ‘analysis’ of data, whether quantitative or qualitative. Taken literally, analysis is a ‘breaking up’ of something complex into smaller parts and explaining the whole in terms of the properties of, and relations between, these parts. Not only is this, necessarily, a reductionist process but it is also seen by many as also necessarily reliant on the particular form of statistical reasoning where hypotheses are based on probability theory applied to sampling distributions. This approach, discussed in Chapter 17, has an important role when dealing with quantitative data from some experimental and other fixed designs. However, in real world research which generates quantitative data, it is rare to find that the rather restrictive design assumptions for the approach are met. The major research traditions in flexible design research are incompatible with the approach.

Interpretation carries very different conceptual baggage. Whereas the purpose of analysis is often seen as a search for causes (usually in the positivistic ‘successionist’ sense discussed in Chapter 2, p. 32), interpretation is considered to be about shedding light on meaning. This is a well-established view of the task when dealing with qualitative data, but Byrne (2002) makes a persuasive case for also focusing on the interpretation of quantitative data.

Quantitative and qualitative data – and their integration in multi-strategy designs

The following two chapters focus on the analysis and interpretation of quantitative and qualitative data respectively. Multi-strategy (mixed methods) designs will have substantial amounts of both types of data for which the techniques and approaches in the chapters can be used. They can make separate contributions to the findings of the study but there is also a possibility of their integration to take full advantage of the opportunity provided by this type of design. *The final section of Chapter 18, p. 484 discusses some of the issues involved.*