five

FROM RESEARCH QUESTIONS TO DATA

From a teaching point of view, there are really two parts to this chapter. One part – sections 5.1 through 5.3, and sections 5.6 through 5.8 – is quite straightforward, and not difficult intellectually. The other part – sections 5.4 on value judgements and 5.5 on causation – is much more challenging, and, like some of the material in Chapter 2, goes into philosophy of science issues. As before, for some students this philosophical part is difficult territory. In my view, that is not a good reason for not dealing with it. However, especially when there are pressures of time, some lecturers may feel it is better not to go too deeply into these issues at this stage (they can always be returned to later, if time permits). Even if not dealt with in depth, I think there are important 'take away' messages on both topics, and I have indicated these in the notes below.

The empirical criterion

This is not a difficult idea to understand, but, once again, it is central to the way research works, and in planning research. There is real benefit in pushing research questions to the point where they clearly indicate what data are needed to answer them. Indeed, I use this as a 'test' on whether a set of research questions is 'ready', and whether therefore the project can move from question development through strategy and design to methods. When one or more questions do not conform to the empirical criterion – by not indicating what data are needed – the usual remedy is to do further question development work. Once we have a clear view of the data a project will need, we can proceed to design the study to enable the data to be collected. In my experience, having worked with hundreds of graduate students in different countries over very many years, projects always benefit from more rather than less time being invested in question development work. Such work is always guided by the empirical criterion.

Linking concepts and data

This section expands on the point made in Chapter 3 – that there must be tight logical connections across different levels of abstraction. Concepts are at a more abstract level than data. Logical bridges across the levels are needed.

The Charters' paper quoted is one of the few examples I have seen in the literature of the careful 'downward' development of these linkages. It is in all respects an excellent paper, and I don't know why it has not been more widely published and used. 'Downward' here means making the link from concepts to data. There is of course no reason why links cannot be made the other way – 'upwards', from data to concepts. Indeed, the analysis of qualitative data often proceeds this way, as in grounded theory or any other inductive analytic approach. The difference is that this linking does not happen at the stage of developing research questions. It happens later.

For those familiar with traditional quantitative research, the Charters' example shows how concepts are operationalised.

Value judgements

Here we enter difficult and contested territory. It is difficult because, as noted, it is fundamentally philosophical. It is contested because there are strongly held points of view which are in opposition to each other. While I think there may be some merit in some contexts to skipping the more difficult philosophical stuff (the fact-to-value gap assertion and its criticisms), I think all students should be aware of what value judgements are, and should know that they are controversial and why. It is generally not a good idea for graduate students to be proposing research questions which contain or imply value judgements. In most cases, re-phrasing questions can avoid the issue, while not materially changing what the student wishes to study. Simplifying things, I think there are four 'take-away messages' from this section – four points students should be aware of, even if class time does not permit full philosophical analysis of the issues:

1. What is a value judgement (or value statement)? A value judgement (VJ) is any statement which contains a moral judgement involving good/bad, right/wrong or any synonyms of these terms (e.g. better/worse, best/worst, worthwhile/worthless, etc.). These are explicit value judgement terms, but a more implicit value judgement is often implied by such terms as should, ought or must. When research questions are phrased using such words as these (should, ought to, must, or good/bad, right/wrong, etc.), warning bells should sound – more question development analytic work is probably needed.
2. What is the central issue? Why are VJs a problem in empirical research? The reason value judgements are a problem in empirical research is that it is not clear whether, or how, empirical information – that is, data (or evidence) – can be used in supporting or refuting such judgements. This is because of the idea of the fact-to-value gap. Those who accept that there is a fact–value gap believe that there is, and can be, no logical connection between statements of fact and statements of value, and therefore that all the facts in the world (that is, all the empirical evidence in the world) are irrelevant to the making of VJs. But empirical research, obviously, is restricted to empirical data, to collecting, analysing and understanding the facts. Notice that an implication of this view is that science itself can have nothing to say about VJs because the scientific method is based on empiricism. Science depends on the empirical method and is restricted to facts. If the fact-to-value gap position is accepted, it

means that the scientific way of building knowledge (which is building and testing theories using empirical data) must be silent on questions of values.

While this position – that facts and values are fundamentally different from each other and cannot be connected logically – has a long history (it traces back to Scottish philosopher David Hume in the 18th century), it has been under strong attack in the last 40 or so years. This is why I describe the issue as 'contested'.

(Notice that none of this is to deny the importance of value judgements. Even if the fact-to-value gap is accepted, it does not mean VJs are somehow less important. Indeed, they are surely among the most important judgements we as humans have to make. It simply means that we cannot use evidence, or data, to support value judgements. We have to find some other basis for supporting and justifying them. Trying to find such a basis has been a major task in the history of western philosophy.)

3. How re-phrasing can often avoid a VJ. Sometimes simple re-phrasing can avoid the problem, turning a VJ question into an empirically researchable one. A clear example is: Should nurses wear white uniforms? It is not at all clear how we could use evidence to answer this question. It is not clear, in other words, what data we would need to answer it. As a research question, it fails the test of the empirical criterion. But if we ask: Do nurses (or patients, or hospital administrators, or some other group) think nurses should wear white uniforms? we now have a question which indicates what data we would need to answer it, and we can proceed to design a study to collect and analyse the data. This simple strategy works with any such question. For example: Should teachers know the IQ of their students? It is worth working through this example (and others) with the class. The strategy works the same way even with such 'cosmic' questions as: 'What is the meaning of life?' In this form, the question is not empirically answerable, but 'what do (different groups of people) think is the meaning of life?' *is* empirically answerable.
4. Three points to keep in mind in proposal development. Because this issue is contested, it means there are different points of view about it. Therefore, I offer three very general points of advice for proposal development. They are given at the end of section 5.4, and are reproduced here:

   (a) We should be aware that there are different positions on this issue of value judgements and therefore not be surprised if we encounter different reactions to it.
   (b) We should recognise when value statements are being made, and be careful about phrasing research questions in value judgement terms – to admit the value-ladenness of facts does not itself justify the making of sweeping value judgements. We should be aware of synonyms for 'good/bad' and 'right/wrong', which may camouflage the value judgements but do not remove the issue.
   (c) If value judgement terms are used in questions, we can first determine whether they are being used in the instrumental or terminal sense. If instrumental, we can rephrase the question to get rid of the value judgement term(s). If terminal, we should indicate how the evidence will be used in relation to the value judgements.

Causation

Again, there is philosophy involved here, and it might suit to skip the philosophy in some contexts, while making sure the 'take-away message', as shown below, is understood.

Cause and effect are two terms which are joined together in the philosophy of science literature. They are two sides of the one idea – causes have effects and effects have causes. The meaning of cause is understood in terms of effect and vice versa. Therefore, to talk about one of these terms is to talk about the other. Like other writers on this topic, for simplicity I have phrased what I have written about this in terms of causes (and causation) rather than effects, but both terms are involved.

Why are the terms cause and causation a problem?

The main reason is that a satisfactory definition of cause, which fits with our everyday thinking and use of the term, involves a non-empirical element. As I hope I have shown in the chapter, the necessary connection view of causation is the one we really mean but it has a non-empirical element. This non-empirical element means that causation cannot be directly observed. If it cannot be observed, it must be inferred. This gives rise to the important question: Under what circumstances is it plausible, and valid, to infer that an observed relationship is a causal one? As indicated, this question has been at the centre of the philosophical issues underlying research design, especially quantitative research design. A consequence of this is that while studies aiming to trace cause–effect relationships can be designed, the designs are usually complex and difficult. (This is why experimental design, for example in psychology, is such an important and complex topic.) Therefore, simplistic statements about finding cause(s) are, in general, not appropriate.

The implication of this is that we need to alert students to the dangers of using the terms cause and effect loosely. There are two things we can do about this:

1. We should refrain from loose use of the terms cause and effect in empirical research. It is possible to design research where these terms are accurate and appropriate but it is not easy. Therefore, it is generally good advice to use the usual replacement terms – independent and dependent variable in a quantitative context (see Table 5.1) and less positivistic terms in a qualitative context.
2. Knowing that we will continue to think causally, despite the philosophical difficulties involved, we can distinguish between (a) empirically demonstrating a relationship – that is, showing that things are related or connected in some way, and (b) interpreting or explaining this relationship or connection. If the interpretation we prefer is a causal one, we can argue for this, making clear that it is an interpretation, and showing why we prefer it, while not claiming that we have proved it.

Note: On this general topic of the relationships between variables, the different types of relationships that are possible and what they mean, one of the best books I have seen is Morris Rosenberg's *The Logic of Survey Analysis*. First published in 1968, it is excellent – easy to read and understand, but, in my view, extremely important. It is just as useful when we are teaching the topic of the analysis of quantitative survey data – it lays bare the logic behind much of what we do and does not demand high levels of mathematics in order to be understood.

A note about Figure 5.1: the really important cell here is the top right-hand one, with several independent variables and one dependent variable. This feeds into the central quantitative strategy of accounting for variance (Chapter 10) and multiple regression analysis (Chapter 12), described later on. This strategy and design is both powerful and an especially useful and robust way for quantitative student thesis projects to proceed.

Conceptual frameworks

There is often confusion about this term and what it means. It really means exactly what it says: a CF is a framework of concepts. Developing any research project means working with a set of concepts (factors, variables, phenomena, whatever), with a view to finding out how they are distributed, or how they interact and are related, or how they come about, or what their consequences are, etc. It is often useful, in developing and clarifying these ideas, to represent them diagrammatically, using any sort of diagram which helps. And if that can be done, it helps in communicating about the project, as in a proposal for a dissertation. Such diagrams, especially in qualitative projects, are usually iterative and cumulative, with frequent drafting and redrafting (note: avoid diagrams which confuse/don't help).

Examples are everywhere – thus Figure 4.1; the model of research shown in Figure 1.1 especially, the Miles and Huberman overall framework for analysing qualitative data (Figure 9.1) and especially their book, *The Analysis of Qualitative Data*, which is a 'treasure trove' of ideas and examples of conceptual frameworks.

There is no requirement that research should include a CF – that is why the table of proposal headings shown in Chapter 15 says 'if appropriate'. But it is worth trying, to see if it helps. Here, as elsewhere in research, let common sense prevail.

From research questions to data

In this section (5.7), I am keen to get across three main messages:

1. That data do not occur naturally in the form of numbers and that there is, therefore, nothing God-given about measurement. At the same time, measurement can be very useful in helping to answer questions and build knowledge, when used appropriately. It is we as researchers who turn data into numbers, and we should think carefully about this when we are deciding whether or not to do it. There is no rule that says we have to turn data into numbers. The questions rather are: Can we do it? And will it help to do it? This of course takes us into the concept of measurement itself. As is discussed more fully in Chapter 10, measurement is not mysterious (though this does not mean that good measurement is easy to achieve) and it is often misunderstood. It was at the centre of the paradigm wars between quantitative and qualitative researchers, coming in for a great deal of criticism. While intelligent and constructive criticism is valuable, much criticism of measurement (turning data into numbers) is ill informed. A prominent example is the qualitative researcher who argues strongly that it is

wrong and misguided to turn data into numbers (i.e. to measure) and then says 'this is a better paper than that'. Such a statement is three-quarters of the way towards measurement.

2. That qualitative data have an important role to play, and that often the only way we can understand situations, events and phenomena is through detailed qualitative research.
3. That whether a piece of empirical research has quantitative data only, qualitative data only or a combination of both is a matter which should be assessed on a project-by-project basis, in the light of the research questions being asked, with a very big emphasis on using common sense.

What I really want to do is to develop some understanding of this issue, so that decisions can be informed decisions and criticisms can similarly be informed.