PART I
DOING SOCIAL RESEARCH

Introduction

This book is a basic introduction to *empirical* research methods. It examines a range of methods that try to deal with primary sources of information about the social world – actual people and events that can inform us about the processes, practices and ideas in the social world around us. Working with secondary sources – writings and materials produced by other social researchers – is of course a central aspect of being a researcher and doing research. Skills in using secondary sources are an essential complement to empirical research and you can find guidance on this aspect of research in a range of other texts (see, for example, Hart, 1998).

As you work through this book you will come to realise that the term 'empirical' has a broad range of meanings. Above I linked it to the use of 'primary sources' – the collections of 'new information' about people and societies. Unfortunately what is counted as useful, relevant, 'reliable' and 'usable' *data* is not so easy to define. In fact what we will often explore in this book are the ways in which social researchers come to decide what is (and is not) good data. Therefore things other than the topic under study often define 'empirical research'. Very often social scientists rely upon philosophical ideas about 'science' and 'knowledge' to help resolve these questions. For philosophers a focus on the 'empirical' may imply a philosophical position of *empiricism* which is often connected to *positivism* . Here the social research methods often rely upon numerical and statistical methods. Such methods are often called 'quantitative' methods. At the other end of the range 'the empirical' is used to denote any methods that are reliant upon primary source information – very often the 'data' is not numerical. Such research does not use statistics and is often called 'qualitative' research. By the time you have worked through this book it should be clear to you that it is possible to engage in empirical research without having to be an 'empiricist'. In other words the philosophical position of *empiricism* fails to capture the breadth and depth of social science research practice.

The book introduces you to some of the key ideas and methods available to contemporary social scientists; it does not attempt to provide a complete introduction to all forms of social research. The intention is to provide you with enough information about research methods to allow you to start thinking about your own research projects as well as understand and critique the methods

described in research publications. The book is split into four parts. Part I is this brief introduction. Following on from our discussion above the next two parts focus on 'Quantitative' and 'Qualitative' methods. In this book I will use the phrases 'Numerical' and 'Textual' methods rather than 'Quantitative' and 'Qualitative'. My main reason for doing this is to remind you that some methods produce 'numbers' – they attempt to measure the social world. Others focus on 'meanings' – they produce descriptions and 'understandings' of social life. Part II focuses on quantitative research. It introduces the basic ideas behind survey and experimental methods. It also provides a 'walk through' for examples of the three main 'types' of statistical test. Part III is concerned with qualitative and textual research, focusing on interview, ethnographic and discourse analytic methods. It includes an opportunity to qualitatively 'code' a text and to examine a piece of 'interaction'. Part IV concludes the book by briefly considering the question of how to select a research method.

Using this Book

This book is designed to be used alongside one or more texts that specifically examine the philosophical basis of social research. A selection of useful and relevant texts of this kind is given in the further reading section at the end of this part. Some discussion of the philosophical, or to be precise 'epistemological' issues behind social research will take place at various points but this book is not an introduction to this topic. When discussing these issues I will mostly reference Smith (1998), which provides a full discussion of links between research methods and philosophical positions and social theories. This book and Smith (1998) were developed together and we hope that readers will find them complementary. I will also indicate the points where other texts provide useful and relevant comment.

A large part of the teaching in this book takes place through self-assessment tasks and questions (SAQs). They direct you to read extracts from various social science research publications, consider important questions, or practise specific skills. Bear in mind that if you skip the SAQs you will be limiting your learning about research methods. The extracts, headed Reading A, B, C, etc., appear after the main text of Parts II and III. Suggested solutions to the SAQs are provided at the end of Parts II, III and IV.

1 *Social Research as Practice*

Empirical social research is a practical activity. It involves the collection, exploration and reporting of information about people and societies. While this book concentrates on methods – that is, on how one goes about these basic tasks – you will need to keep in mind the various influences that have, over time, affected the development of these methods. The most important of these influences are:

- *philosophical ideas about science and social science.* Philosophy has provided a great number of models of the process of doing research which have been drawn upon by social scientists when developing research methods.
- *theories and findings from social science.* Because social science is a very 'reflexive' activity, new findings often lead to new ideas about how to go about researching the social world.
- *practical constraints on conducting actual research.* Whatever the philosophical position we might start from, or the social science idea that informs our research, or the tools we use, we are faced with the practical task of actually doing research. This experience, and the need to work within the constraints of an actual research context, can alter our choice and application of methods, and it can also inform our philosophical models of the research process itself.

One social scientific way in which we might view this is to consider social research as a 'social practice' that is influenced by this set of three related and competing factors. The idea of viewing 'social research' in this way is relatively new and flows from a specific set of philosophical perspectives. These positions can be described as 'idealist' or 'relativist' (See Smith, 1998: Chapters 1, 4, 6 and 7). For each of the methods examined I will try to comment upon the ways in which these three factors influence the practices of social researchers.

Whatever the specific influences on a particular research method there is an overall structure to nearly all types of social research. This structure involves five 'stages'. First, there is the reasoning behind the social research project itself. Social research is done for a number of reasons. In most cases researchers are attempting to explore a new theory or social context; in some cases the goal is to 'test' the theory, in others to bring to light the details of some aspects of social life. Second, whatever the method used, the next main step is the collecting of information and

evidence – what can be generally described as 'data'. Third, the researcher will also explore, or analyse, the collected data. Fourth, the results of this exploration are interpreted, which involves linking them back to the ideas which formed the reasoning for the research. Last, these interpretations are usually presented to a particular audience, usually in the form of a written/published text.

Try to keep these five stages in mind as you work through this book. In studying each method you need to consider the philosophical and social science ideas that have influenced its development, the practical problems that need to be overcome and the ways in which the method addresses the different stages of the research process. You may wish to refer to more general works on the philosophy of the social sciences as you go along. Along the way I have indicated some relevant parts of Smith (1998). You might wish to use another text. Some possible candidates are indicated in the further reading.

Further Reading

Crotty, M. (1098), *The Foundations of Social Research: Meaning and Perspective in the Research Process*. London: Sage.

Martin, M. and McIntyre, L.C. (eds) (1994) *Readings in the Philosophy of Social Science*. London: MIT Press.

Smith, M. (1998) *Social Science in Question*.:London: Sage.

PART II QUANTITATIVE RESEARCH METHODS

Introduction

This part introduces you to two methods of conducting empirical social research: survey research and experimental research. After a brief introduction to the general process of conducting quantitative research I will introduce the main elements of each method and their strengths and weaknesses. You will then work through examples of a statistical analysis to gain a general understanding of this technique and the contexts in which it can be applied.

There are a number of reasons why these two empirical research methods have been placed together. First, both are most often associated with 'natural science' based approaches to social research. In the history of social research there has been a two-way flow of ideas, if not always a perfect one, between the practical realities of research and the philosophy of the social sciences. Surveys and experiments are often described both proudly and derogatively, depending upon who is speaking, as being positivist and/or empiricist (see Smith, 1998: Chapters 2 and 3).

This part weighs up this association with the natural sciences against the actual day-to-day workings of research methods, arguing that methods are influenced by philosophical arguments about social science, but that they are also influenced by the practicalities of doing research. This often leads to a complex situation. In the case of the quantitative and numerical methods discussed here you will find that the practicalities of conducting research have an impact on the application of positivist ideas. In many cases, though the research might be categorised as 'positivist', and may, in fact, be designed to reflect the goals of positivist thinking, it will also be limited by the need to develop practically useful methods. It is important to engage in empirical work, but that empirical work does not by definition have to be empiricist or positivist to be useful and valid.

A second reason why these methods have been brought together is the extent to which they often rely upon quantitative, essentially numerical, evidence. Smith (1998) points out that one key element of 'natural' science, or positivist, approaches, is their belief thta social science can 'measure' social phenomena. Both survey and experimental research methods often make extensive use of various forms of social measurement. The third reason for bringing these methods together relates to the issue of 'control'. An important element of attempts to re-create natural science methods in the social sciences concerns the ability to control the

elements under examination. This control is achieved through the construction of 'closed systems'. Survey research attempts to gain closure by the use of sampling, experimental research in the design of the experiment. In both cases statistics are often used to complete the process (see Smith, 1998: Chapters 2 and 3).

2 *General Research Process*

All social science research goes through some form of overall process by which information is collected and related to the ideas or goals of the researcher. Many quantitative researchers describe this process in a manner which combines elements of both **inductive** and **falsificationist** methods, and which is seen to reflect the process of natural science research. Bryman and Cramer (1990) provide the following diagram to explain the process

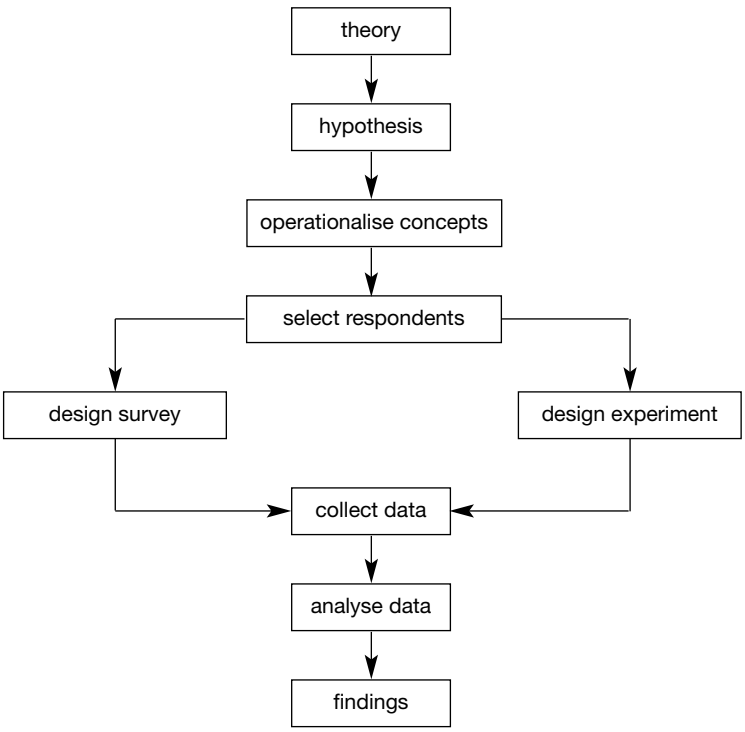

Figure 2.1 *Quantitative research process (adapted from Bryman and Cramer, 1990: 3)*

There are eight parts to the process of conducting quantitative research as presented in this figure:

1 Theory
2 Hypothesis
3 Operationalisation of concepts
4 Selection of respondents or cases
5 Research design
6 Collection of data
7 Analysis of data
8 Findings

We will examine this process in detail on pp. 00–00 by looking at several examples of survey and experimental methods. Along the way we will explore the key elements of each method and consider how they go about attempting to achieve some form of closure.

Study Comment
Please ensure that you attempt each of the self-assessment questions (SAQs), as a large part of the teaching takes place in these set tasks. If you leave out the SAQs you will limit your learning of the material.

SAQ 2.1

Turn to Reading A, 'Data analysis and the research process', which is an extract from Bryman and Cramer's discussion of Figure 2.1. After you have read each section, from the one headed 'Theory' onwards, answer the section-relevant questions below. There is no section on collecting data as Bryman and Cramer do not touch on this process.

Theory

1 Describe in one or two sentences the type of theory Bryman and Cramer see as being 'most likely to receive empirical attention'.
2 Can you name two or three such theories from *Social Science in Question*, Chapter 3?

Hypothesis

3 Write down in one or two sentences how hypotheses are related to theory.
4 Write down in two sentences what Bryman and Cramer see as being the benefits and problems of formulating an hypothesis.

Operationalisation of concepts

5 Which natural science do Bryman and Cramer claim that the term 'Operationalisation' is derived from?
6 Write down in one or two sentences how Hirschi operationalised the concept of 'commitment to conventional society'.

Selection of respondents or cases

7 Write down in one or two sentences the way in which Hirschi selected respondents in order to ensure that the findings would hold true in general.

Setting up a research design

8 Write down the two types of research design which Bryman and Cramer claim are most common in psychology and sociology.
9 Write down a few of the differences between these designs as described by Bryman and Cramer.
10 Which of these categories of design does Hirschi's work fit into?

Analysing data

11 Write down the names for the three types of data analysis pointed out by Bryman and Cramer.
12 Write down in one or two sentences the difference between an 'experimental' and a 'control' group.

Findings

13 Write down in two or three sentences the ways in which the results from analysing data relate to the hypothesis and to the original theory.

Here you have met most of the terms and issues that will be dealt with in the following sections. Some of the more important terms and issues are:

- theory
- measure
- sample
- experimental design
- univariate
- hypothesis
- variable
- random sample
- survey design
- bivariate
- concept
- observation
- representative sample
- multivariate

Don't worry if you have not met some of these before, or if you are not yet comfortable with how to apply them; we will discuss them in depth during your study of this part. Before moving on to the discussion of survey and experimental methods we need to consider the argument of Bryman and Cramer in relation to *Social Science in Question*.

Natural Science and Quantitative Data Analysis

It is clear from Figure 2.1 and the references to natural science methods in the Bryman and Cramer reading that the process of quantitative social research can be seen as similar to if not the same as that of the natural sciences. Social scientists can draw on natural science ideas in two main ways.

- First, they can use natural science models as *metaphors* for social phenomena. For example we can find in the history of social science many ways of 'explaining' phenomena by using models or metaphors from other sciences. We can often find arguments that social phenomena are like biological phenomena. They 'evolve', or have an organisation like an 'organic systems'. We can even find engineering or computing metaphors.
- Second, they can attempt to replicate the *methods* used in the natural sciences. Though much research that uses 'natural science methods' may also use 'natural science metaphors' we will concentrate in this section on how social scientists have tried to replicate or transfer natural science methods to social research.

The main manner in which social scientists attempt to do this is through the production of 'closed systems' (See Smith, 1998: Chapter 2). Closed systems are ones where no 'external factors' influence the ways in which the system functions. Most natural science experiments try to create such situations. For example in chemistry an experimenter will make sure that the laboratory and the equipment are very clean. They will measure out exact proportions of the chemicals, etc. By doing this they can be sure that the product of an experiment has come from the reaction between the chemicals they used. No other factors (such as a dirty test tube) affected the results. A closed system therefore allows the observer to test out their predictions about the relationships between the various elements within the system without having to worry that some other factor might influence the result. The researcher employs various controls that remove or minimise the effect of external factors. The opposite to a closed system is an open system. Here there are so many factors at work and there are no 'controls' on how they interact. In fact nearly all 'real' systems in the world (things like societies, the weather, the galaxy) are open systems. Table 2.1 is taken from Smith (1998) and distinguishes the features of open and closed systems.

Table 2.1 *Features of open and closed systems*

	Closed systems	Open systems
Simplicity and complexity	A limited number of measurable variables is involved to increase the possibility of identifying and predicting clear relationships	A state of complexity is acknowledged as the condition of one's objects of analysis and the relations between them
External boundary	Exclusion clauses ensure that the confusing mass of possible influences are screened out	No external boundary is assumed to exist so that each object can be part of multiple causal relations and one cannot predict an outcome with any degree of certainty
Intrinsic properties	All objects of analysis are taken at face value so that the intrinsic properties of an object are not considered	Open Systems Analysis recognises that all objects have intrinsic properties and structures whichaffect their performance in different conditions.

Smith (1998) describes three types of closure:

- Experimental
- Theoretical
- Statistical

Table 2.2 details the three methods of gaining 'closure' available to social researchers.

Table 2.2 *Methods of closure*

Experimental closure	Theoretical closure	Statistical closure
This is done through the control of specific events, experiences or cases. Very often in psychology experiments participants are split into separate groups that undergo different experiences. The effects of those differences are then 'measured'	This is about 'modelling' the world. For instance the use of computer models in economics. You control the design of and inputs to the model. If the results are similar to those found in the 'real world' then maybe it is a good model of the real world	This is controlling for chance and other influences by the use of mathematics (statistics). The relationships between numerical measures of some aspects of the social world are assessed to see if something other than chance is at work. It is also the design and use of representative samples to ensure generalisable results

Figure 2.1 therefore highlights the stages that a social researcher might go through to control enough factors in an open system, such as a society, to produce a 'controlled context'. First, the researcher focuses upon an element, factor or variable of the system under study by constructing an hypothesis – a prediction about the system. Second, the researcher finds ways of measuring and categorising the elements of the system by operationalising their theoretical concepts. Third, the researcher controls the elements of the system. In the case of surveys this is done by careful selection of cases (statistical closure) and careful design of

questionnaires. In the case of experiments it is done through the design of the experiment – using experimental closure. Fourth, quantitative researchers can further control and remove the influence of external factors through the use of statistics. Most statistical analyses are designed to separate out 'random' or external effects from those of the system under study. The results of these analyses then confirm or refute the predictions made by the researcher. This is, of course, an idealised version of the process which, as Bryman and Cramer (1990: 7) point out, 'constitutes a model of the research process, which may not always be reproduced in reality. None the less, it does serve to pin-point the importance to the process of quantitative research of developing measures of concepts and the thorough analysis of subsequent data.'

Positivism and Quantitative Research Methods

The obvious question one can ask is this: why should the social sciences use natural science methods? One direct answer is that natural science methods appear to be so successful in their field so of use (See Smith, 1998: Chapters 1 and 2). But this is just part of the story. I argued earlier that philosophies of science and knowledge have had a strong influence on the development of social research methods. In particular the broad set of philosophical ideas known as 'positivism' have directly influenced the development of the social sciences from the mid 1800s to the present (See Smith: 1998, Chapter 3). We do not have space here to explore the full nature of positivism but Smith (1998) provides a useful summary of the key assumptions of positivism (see Table 2.3).

Table 2.3 *Main assumptions of positivism*

Assumption	Definition	Implication
Naturalism	Positivists are committed to naturalism, the idea that it is possible to transfer the assumptions and methods of natural sciences to the study of social objects, often referred to as the 'unification of method'.	This means that you would study behaviour, institutions and society in much the same way as studying, for example, chemical processes, hydraulic systems, geological structures. The closed system of a scientific experiment is often taken as a model for knowledge production in the social sciences.
Phenomenalism	Phenomenalism is the assumption that only knowledge gained from observed experience can be taken seriously. If something cannot be directly experienced it is said to be metaphysical – beyond our physical senses.	If we cannot touch it, see it, hear it, taste it or smell it, then an object cannot be said to exist except in so far as it is an idea of something. For example, 'happiness' is something which exists only in people's minds and cannot be directly physically experienced.

Table 2.3 *Cont.*

Assumption	Definition	Implication
Nominalism	Nominalism shares with phenomenalism the argument that concepts must be based upon experience, but it also asserts that concepts have no use other than as names. Words are seen as pure reflections of things. It is, of course, very difficult to do this because the words we use are usually far more than simple descriptions.	All concepts or ideas which are not directly experienced through the senses are meaningless. In a strict sense, concepts such as the 'unconscious' and 'capitalism' are names for things we can't directly experience through our senses. Therefore, by this criterion, such concepts are meaningless.
Atomisrn	Atomism is a particular approach to the definition of objects. Atomism states that the objects of scientific study are discrete, that is, the objects cannot be broken down into any smaller parts. These objects act as the foundations of a scientific study. Collective objects are thus the sum total of their smaller atomic components.	When approaching any field of study, atomists look for the smallest observable units which cannot be broken down any further. When studying a society the most discrete unit is often taken as the individual. Atomistic explanations of society would start with the individual and regard society as no more than a collection of individuals.
Scientific laws	The purpose of science is to develop laws. To develop a scientific law you start from the observation of a particular set of objects and look for regularities. The regular appearance of two or more things together, or in some kind of sequence, can be called an empirical regularity. This is sometimes described as a constant conjunction of events. You then explore whether the same regularities occur in other similar circumstances. A scientific law is a general statement which describes and explains empirical regularities that occur in different places and at different times.	The search for scientific laws involves finding empirical regularities, such as the well known example of smoking tobacco and developing lung cancer. Social scientists adopting this assumption would look for empirical regularities between, say, poverty and crime, the money supply and price inflation, school class sizes and literacy levels, gender and earnings, and so on. In practice, one is usually taken as the cause of the other. For instance, high levels of poverty are seen as a causal factor in crime levels.
Facts/values	Facts and values are seen as distinct, Only facts can be regarded as scientific. Facts can be empirically verified, that is, observed, measured and explained by reference to observational evidence. Values involve subjective assessments and claims about what ought to be. Thus values cannot be observed, measured or explained.	Social scientists accepting these assumptions would distinguish scientific statements, which describe what is the case, from unscientific vaiue-laden statements. For example, a measure of the number of homeless is often viewed as a fact whereas the statement that homelessness is a social evil is a value statement.

Quantitative or numerical research methods are often associated with the terms 'positivism' and 'empiricism' for a number of reasons. First, by using or replicating methods from the natural sciences they are in line with the assumption of

naturalism – that all phenomena can be explained in the same way through the 'scientific method'. Second, many forms of quantitative research rely upon 'observations' of human behaviour. In fact they assume that one can observe and measure the social world directly. This fits the assumption of phenomenalism – that only directly experienced data is relevant to science. Third, many quantitative methods assume that words and terms have universal and fixed meanings. For instance, they may assume that the word 'work' has the same meaning for all respondents to a questionnaire. This fits the assumption of nominalism. Fourth, quantitative methods have a tendency to focus upon individual units of a system and individual respondents (e.g. individual people, individual families, individual factories, etc.). This fits the assumption of atomism. Fifth, a goal of much quantitative research is the production of general statements, or 'laws', which hold across a range of contexts. This fits the assumption of scientific laws. Last, the processes of hypothesis formation, concept operationalisation and research design are intended to limit the impact of the researcher's value system on the research itself. This fits the assumption of a distinction between facts and values. Though one can therefore clearly argue that positivist thinking has influenced quantitative or numerical social research methods we need to be careful how far we take this argument. We need to separate this apparent influence from the actualities of research practice. In the following sections we will consider how and if actual examples of quantitative methods fit positivist criteria. We will now move on to explore two main types of 'quantitative' or numerical methods – surveys and experiments.

Further Reading

Bryman, A. and Cramer, D. (1990) *Quantitative Data Analysis for Social Scientists*. London: Routledge.
Crotty, M. (1998), *The Foundations of Social Research: Meaning and Perspective in the Research Process*. London: Sage.
Halfpenny, P. (1992) *Positivism and Sociology: Explaining Social Life (Modern Revivals in Sociology)*. London: Gregg Revivals.
Kumar, R. (1996), *Research Methodology: A Step by Step Guide for Beginners*. London: Sage.
Martin, M. and McIntyre, L.C., (eds.), (1994), *Readings in the Philosophy of Social Science*. London: MIT Press.
Smith, M. (1998) *Social Science In Question*. London: Sage.

Reading A: Data Analysis and the Research Process

Alan Bryman and Duncan Cramer

Why should social-science students have to study quantitative data analysis, especially at a time when qualitative research is coming increasingly to the fore (Bryman, 1988a)? After all, everyone has heard of the ways in which statistical materials can be distorted, as indicated by Disraeli's often-quoted dictum: 'There are

lies, damn lies and statistics.' Why should serious researchers and students be prepared to get involved in such a potentially unworthy activity? If we take the first issue – why social-science students should study quantitative data analysis – it is necessary to remember than an extremely large proportion of the empirical research undertaken by social scientists is designed to generate, or draws upon, quantitative data. In order to be able to appreciate the kinds of analyses that are conducted in relation to such data and possibly to analyse their own data (especially since many students are required to carry out projects), an acquaintance with the appropriate methods of analysis is highly desirable for social-science students. Further, although qualitative research has quite properly become a prominent strategy in sociology and some other areas of the social sciences, it is by no means as pervasive as quantitative research, and in any case many writers recognize that there is much to be gained from a fusion of the two research traditions (Bryman, 1988a).

On the question of the ability of statisticians to distort the analyses that they carry out, the prospects for which are substantially enhanced in many people's eyes by books with such disconcerting titles as *How to Lie with Statistics* (Huff, 1973), it should be recognized that an understanding of the techniques to be covered in our book will greatly enhance the ability to see through the misrepresentations about which many people are concerned. Indeed, the inculcation of a sceptical appreciation of quantitative data analysis is beneficial in the light of the pervasive use of statistical data in everyday life. We are deluged with such data in the form of the results of opinion polls, market-research findings, attitude surveys, health and crime statistics, and so on. An awareness of quantitative data analysis greatly enhances the ability to recognize faulty conclusions or potentially biased manipulations of the information. There is even a fair chance that a substantial proportion of the readers of this book will get jobs in which at some point they will have to think about the question of how to analyse and present statistical material. Moreover, quantitative data analysis does not comprise a mechanical application of predetermined techniques by statisticians and others; it is a subject with its own controversies and debates, just like the social sciences themselves. Some of these areas of controversy will be brought to the reader's attention where appropriate.

Quantitative Data Analysis and the Research Process

In this section, the way in which quantitative data analysis fits into the research process – specifically the process of quantitative research – will be explored …

Figure 2.1 in main text] provides an illustration of the chief steps in the process of quantitative research. Although there are grounds for doubting whether research always conforms to a neat linear sequence (Bryman, 1988a, 1988b), the components depicted in Figure [2..1] provide a useful model.The following stages are delineated by the model . . .

Theory

The starting-point for the process is a theoretical domain. Theories in the social sciences can vary between abstract general approaches (such as functionalism) and fairly low-level theories to explain specific phenomena (such as voting behaviour, delinquency, aggressiveness). By and large, the theories that are most likely to receive direct empirical attention are those which are at a fairly low level of generality. Merton (1967) referred to these as theories of the middle range, to denote

theories that stood between general, abstract theories and empirical findings. Thus, Hirschi (1969), for example, formulated a 'control theory' of juvenile delinquency which proposes that delinquent acts are more likely when the child's bonds to society are breached. This theory is in large part derived from other theories and also from research findings relating to juvenile delinquency.

Hypothesis

Once a theory has been formulated, it is likely that researchers will want to test it. Does the theory hold water when faced with empirical evidence? However, it is rarely possible to test a theory as such. Instead, we are more likely to find that a hypothesis, which relates to a limited facet of the theory, will be deduced from the theory and submitted to a searching enquiry. Hirschi, for example, drawing upon his control theory, stipulates that children who are tied to conventional society (in the sense of adhering to conventional values and participating or aspiring to participate in conventional values) will be less likely to commit delinquent acts than those not so tied. Hypotheses very often take the form of relationships between two or more entities – in this case commitment to conventional society and juvenile delinquency. These 'entities' are usually referred to as 'concepts' – that is, categories in which are stored our ideas and observations about common elements in the world . . . Although hypotheses have the advantage that they force researchers to think systematically about what they want to study and to structure their research plans accordingly, they exhibit a potential disadvantage in that they may divert a researcher's attention too far away from other interesting facets of the data he or she has amassed.

Operationalization of Concepts

In order to assess the validity of a hypothesis it is necessary to develop measures of the constituent concepts. This process is often referred to as *operationalization*, following expositions of the measurement process in physics (Bridgman, 1927). In effect, what is happening here is the translation of the concepts into variables – that is, attributes on which relevant objects (individuals, firms, nations, or whatever) differ. Hirschi operationalized the idea of commitment to conventional society in a number of ways. One route was through a question on a questionnaire asking the children to whom it was to be administered whether they liked school. Delinquency was measured in one of two ways, of which one was to ask about the number of delinquent acts to which children admitted (i.e. self-reported delinquent acts). In much experimental research in psychology, the measurement of concepts is achieved through the observation of people, rather than through the administration of questionnaires. If the researcher is interested in aggression, for example, a laboratory situation may be set up in which variations in aggressive behaviour are observed. Another way in which concepts may be operationlized is through the analysis of existing statistics, of which Durkheim's (1952/1898) classic analysis of suicide rates is an example . . .

Selection of Respondents or Subjects

If a survey investigation is being undertaken, the researcher must find relevant people to whom the research instrument that has been devised (for example, self-administered questionnaire, interview schedule) should be administered. Hirschi,

for example, randomly selected over 5,500 schoolchildren from an area in California. The fact of random selection is important here because it reflects a commitment to the production of findings that can be generalized beyond the confines of those who participate in a study. It is rarely possible to contact all units in a population, so that a *sample* invariably has to be selected. In order to be able to generalize to a wider population, a *representative sample*, such as one that can be achieved through random sampling, will be required. Moreover, many of the statistical techniques . . . are *inferential statistics*, which allow the researcher to demonstrate the probability that the results deriving from a sample are likely to be found in the population from which the sample was taken, but only if a random sample has been selected . . .

Setting up a Research Design

There are two basic types of research design that are employed by psychologists and sociologists. The former tend to use *experimental* designs in which the researcher actively manipulates aspects of a setting, either in the laboratory or in a field situation, and observes the effects of that manipulation on experimental subjects. There must also be a 'control group' which acts as a point of comparison with the group of subjects who receive the experimental manipulation. With a *survey/correlational* design, the researcher does not manipulate any of the variables of interest and data relating to all variables are collected simultaneously. The term *correlation* also refers to a technique for analysing relationships between variables . . . but is used in the present context to denote a type of research design. The researcher does not always have a choice regarding which of the two designs can be adopted. Thus, for example, Hirschi could not *make* some children committed to school and others less committed and observe the effects on their propensity to commit delinquent acts. Some variables, like most of those studied by sociologists, are not capable of manipulation. However, there are areas of research in which topics and hypotheses are addressed with both types of research design (for example, the study of the effects of participation at work on job satisfaction and performance – see Locke and Schweiger, 1979; Bryman, 1986). It should be noted that in most cases, therefore, the nature of the research design – whether experimental or survey/correlational – is known at the outset of the sequence signified by Figure [2.1], so that research-design characteristics permeate and inform a number of stages of the research process. The nature of the research design has implications for the kinds of statistical manipulation that can be performed on the resulting data. The differences between the two designs is given greater attention in the next section.

Collect Data

The researcher collects data at this stage, by interview, questionnaire, observation, or whatever . . .

Analyse Data

. . . At a minimum, the researcher is likely to want to describe his or her subjects in terms of the variables deriving from the study. The researcher might for example be interested in the proportion of children who claim to have committed no, just one, or two or more delinquent acts . . . However, the analysis of a single variable (sometimes called *univariate analysis*) is unlikely to suffice and the researcher will probably be interested in the connection between that variable and each of a number

of other variables, i.e. *bivariate analysis*. The examination of connections among variables can take either of two forms. A researcher who has conducted an experiment may be interested in the extent to which experimental and control groups differ in some respect. The researcher might for example be interested in examining whether watching violent films increases aggressiveness. The experimental group (which watches the violent films) and the control group (which does not) can then be compared to see how far they differ … The researcher may be interested in relationships between variables – are two variables connected with each other so that they tend to vary together? Hirschi (1969: 121), for example, presents a table which shows how liking school and self-reported delinquent acts are interconnected. He found that whereas only 9 per cent of children who say they like school have committed two or more delinquent acts, 49 per cent of those who say they dislike school have committed as many delinquent acts . . . Very often the researcher will be interested in exploring connections among more than two variables, i.e. *multivariate analysis* . . . The distinction between studying differences and studying relationships is not always clear-cut. We might find that boys are more likely than girls to commit delinquent acts. This finding could be taken to mean that boys and girls differ in terms of propensity to engage in delinquent acts or that there is a relationship between gender and delinquency.

Findings

If the analysis of the data suggests that a hypothesis is confirmed, this result can be fed back into the theory that prompted it. Future researchers can then concern themselves either with seeking to replicate the finding or with other ramifications of the theory. However, the refutation of a hypothesis can be just as important in that it may suggest that the theory is faulty or at the very least in need of revision. Sometimes, the hypothesis may be confirmed in some respects only. Thus, for example, a multivariate analysis may suggest that a relationship between two variables pertains only to some members of a sample, but not others (for example, women but not men, or younger but not older people). Such a finding will require a reformulation of the theory. Not all findings will necessarily relate directly to a hypothesis. With a social survey, for example, the researcher may collect data on topics whose relevance only becomes evident at a later juncture.

As suggested above, the sequence depicted in Figure [2.1] constitutes a model of the research process, which may not always be reproduced in reality. None the less, it does serve to pin-point the importance to the process of quantitative research of developing measures of concepts and the thorough analysis of subsequent data. One point that was not mentioned in the discussion is the *form* that the hypotheses and findings tend to assume. One of the main aims of much quantitative research in the social sciences is the demonstration of *causality* – that one variable has an impact upon another. The terms *independent variable* and *dependent variable* are often employed in this context. The former denotes a variable that has an impact upon the dependent variable. The latter, in other words, is deemed to be an effect of the independent variable. This causal imagery is widespread in the social sciences and a major role of multivariate analysis is the elucidation of such causal relationships (Bryman, 1988a). The ease with which a researcher can establish cause-and-effect relationships is strongly affected by the nature of the research design . . .

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Source: Bryman and Cramer, 1990: 1–7

Solution to Chapter 2 SAQ

Theory

1 Theories of a fairly low level of generality: between general abstract theories such as functionalism, and specific empirical assertions.
2 Durkheim on suicide; Eysenck on IQ; Barker on new religious movements; Goldthorpe and Lockwood on affluent workers.

Hypothesis

3 Hypotheses tend to be constructed from one facet, one specific aspect, of a theory.
4 An advantage of hypotheses is that they force researchers to think systematically about an aspect of their research. A disadvantage of hypotheses is that they may divert attention from other interesting aspects of the data a researcher collects.

Operationalisation of concepts

5 Physics.
6 Hirschi operationalised this concept by asking children if they liked school. If children liked school they were likely to be committed to the values of school life and therefore society at large.

Selection of respondents or cases

7 Hirschi used 'randomly' selected schoolchildren from one area. Random sampling is designed to ensure a representative sample and therefore generalisable results.

Setting up a research design

8 Surveys and experiments.
9 In experiments the researcher can control aspects of the situation under study; in surveys this is often not the case. Experiments tend to focus upon observations of behaviour whilst surveys tend to question subjects directly.
10 Survey research.

Analysing data

11 Univariate, bivariate, multivariate.
12 An experimental group consists of those subjects undergoing some form of manipulation (e.g. watching a video). A control group consists of those subjects who do not undergo some form of manipulation (e.g. don't watch a video!).

Findings

13 Results can support or refute an hypothesis. If an hypothesis is supported this lends support to the theory. If an hypothesis is refuted this casts doubt on aspects of the theory.