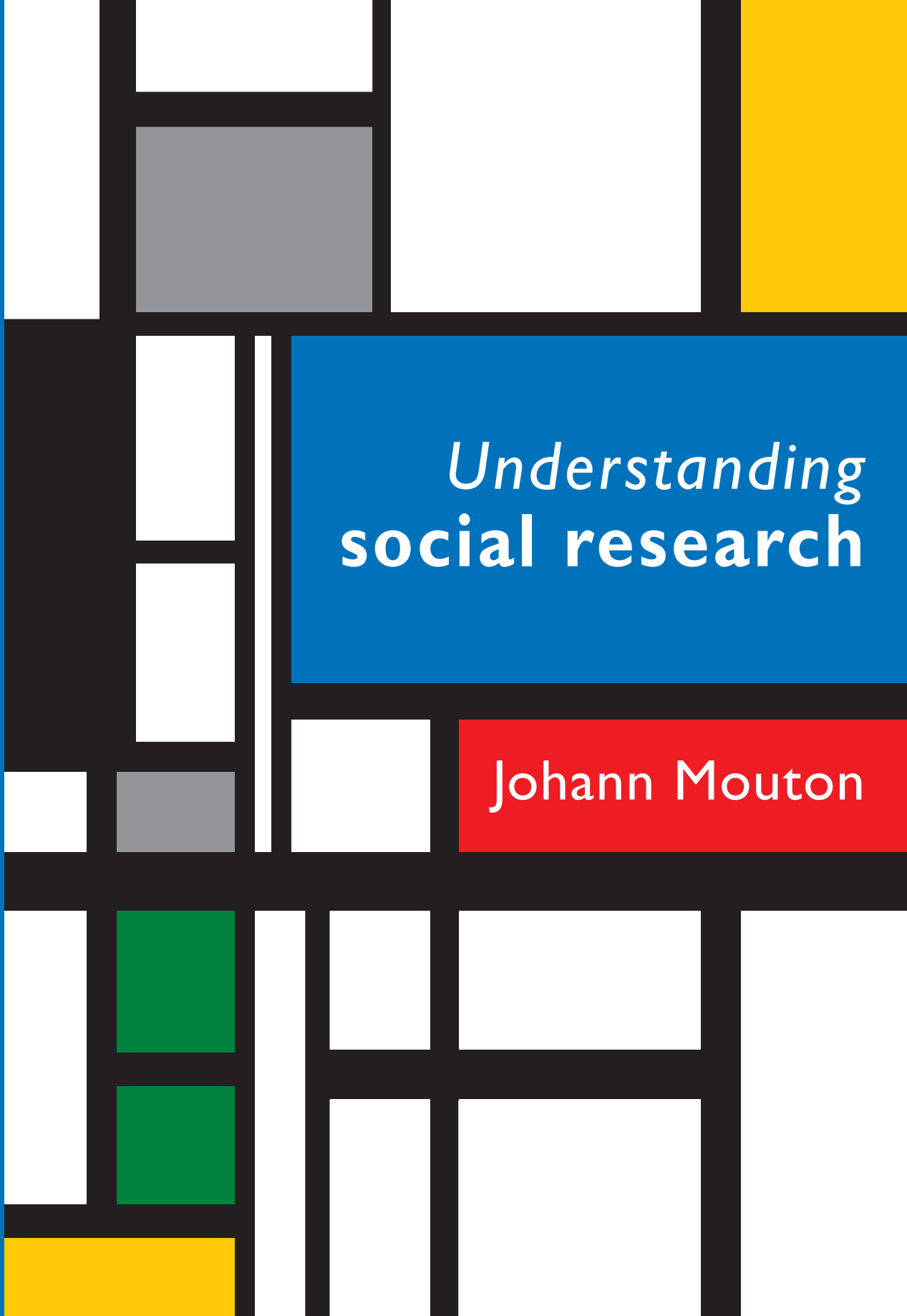
Understanding
social research
Johann Mouton

# Understanding social research

*Johann Mouton*

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# *Preface*

The aim of this book is to introduce novice researchers to the world of social science research. Unlike some of the other 'worlds' to which you have become accustomed, the world of science may constitute an unknown and therefore somewhat threatening world. This may be because you have been taught that the world of science is the world of the very learned and the exceptionally intelligent. You might even have been made to believe that, in a fundamental sense, the world of science is different from our ordinary world. This perception might well have been reinforced by various images that we grow up with; images such as those of the wise men (and women) of science, of the eccentric professor and the laboratory scientists in their white coats. These perceptions are further strengthened by the sometimes highly complex and incomprehensible terminology (jargon) that scientists use. All of these factors may lead one to conclude that such a world is quite inaccessible to the ordinary person.

However, we will show you that the world of science and of scientific inquiry is inhabited by ordinary people who have learned certain practices and acquired certain knowledge and skills, that are – if not fully transparent – at least not totally mysterious. This book will introduce you to the distinctive features of the world of social science. You will see that scientists are committed to the very specific values of truth, objectivity, impartiality and honesty. They do things in very specific ways and tend to follow procedures which, at first glance, might seem unnecessarily repetitive. They are very protective of certain standardised practices (one can even call them *rituals* ) such as making their research public (they usually abhor secrecy), submitting their research to evaluation by their peers and placing a high premium on honesty and integrity (rejecting plagiarism).

This book will not only describe the contents of these practices in some detail, but will also explain why these practices and their underlying values and assumptions are important to the members of the scientific community. It will explain the 'logic' behind what they are doing; why they follow set ways and procedures, why they place such a high premium on the search for truth, objective evidence and logically sound conclusions. And, in the final analysis, the book will also begin to introduce you to some of those same rules and practices. This is in fact the point of the title of the book: *Understanding social research.*

## Outline

The book is divided into four parts. Part one is devoted to the development of a conceptual framework to help you understand the nature of social science research.

Two core ideas guide this model: first, that the world of social science is only one of the numerous worlds that we inhabit; secondly that scientific research is a multidimensional activity that is driven by the ideal of the search for the truth.

In part two we focus on the peculiar logic of the research process and specifically on the three general forms of reasoning that you will encounter in science, namely deduction, induction and retroduction.

Part three comprises the main body of the book and covers the typical stages in the research process. In this discussion, which begins with formulating the research problem and ends with writing up one's findings or results, the emphasis is on issues of validity and research design. It shows how the aim of research is to maximise validity at each stage in the research process by controlling for all possible sources of error.

Part four concludes the book by addressing the key elements of social scientific knowledge more systematically. These four chapters include discussions on the nature of concepts, definitions, empirical statements, typologies, models, theories and paradigms.

All the chapters are similarly structured. Each chapter begins with a brief statement of the central theme of the chapter, followed by a list of the key concepts which you, the student, should understand after having read the chapter. In most cases, the main argument of the chapter is followed by an elaboration of key ideas as stated in the main argument. The main conclusions are summarised at the end of chapters, most of which are then concluded by an assignment, and in some cases, further reflection on an important issue raised in the chapter.

The chapters are deliberately short. I have designed them in such a way that they could ideally fit into a normal lecture period (approximately 30 to 40 minutes). The idea was to limit the contents of each chapter to a number of key concepts. Lecturers are welcome to contact me to order a 'lecturer's manual' that I have written to accompany the book. The manual includes 'model' answers to the assignments, brief summaries of each chapter and suggestions on further readings and material about each chapter.

## Acknowledgements

*Understanding social research* very clearly builds on the text of *Basic concepts in the methodology of the social sciences* which I co-authored with Bok Marais and which was published by the HSRC. *Basic concepts* has become the most widely used methodology textbook in South African universities over the past ten years. I have had the

pleasure of teaching its contents to hundreds of students and lecturers. My first acknowledgement must therefore be to all of these individuals who have challenged me to rethink my ideas continually, and without whom this book would not be possible.

Over the years I have also had the good fortune to have benefited from the feedback of numerous colleagues who have used and/or read the book. There are too many of them to mention by name, but a list would certainly have to include Anemie de Vos, Dian Joubert, Mark Lipsey, Hennie Lotter, Ricky Mauer, Willem Schurink and Hannetjie van der Merwe. A special word of gratitude is due to Anita Craig who has made many useful suggestions about the contents of the book and specifically her notes on Wittgenstein's notion of language games in the first chapter..

This book was written over the past fifteen months – most of that time in my new academic home at the University of Stellenbosch. I wish to express my appreciation to my new colleagues in the Department, but specifically to Bernard Lategan and Walter Claassen who have already made my move down south worthwhile.

I would like to invite all the users of this textbook to send me their comments, criticisms and recommendations. You can reach me on e-mail (jm6@akad.sun.ac.za) or by phone (021 808-3708).

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Stellenbosch
January 1996

# *Annotated contents*

paradigms is discussed with reference to concepts such as normal science and scientific revolutions. The chapter concludes with a discussion of the usefulness of the concept 'paradigm' in social research.

## APPENDIX

PART

# 1

# *Developing a conceptual model of social science*

The primary aim of the first part of the book is to develop a conceptual model or framework to help us understand the nature of social science better. Two core ideas guide the design of this model namely:

that the world of (social) science is only one of numerous worlds that we inhabit; and

that scientific research is a multidimensional activity driven by the ideal of the search for truth.

The first idea is developed in chapters 1 to 4; and the second idea in chapters 5 to 9, while chapter 10 provides an integrated picture of the world of science.

# 1

# *Multiple worlds*

**Central theme**

People live in different 'worlds'. Each world has its own distinct set of usages, rules and roles. Different worlds also have different 'sets of beliefs' or 'stocks of knowledge'.

*Key concepts*

Multiple worlds – stocks of knowledge – body of knowledge – belief systems – forms of life – language games – roles.

## Main argument

One of the distinctive features of being human is that we live many different kinds of lives and constantly assume different roles. Most of us have a professional life – an academic life if you are a student – and also a religious, moral, family, political and economic life. We are simultaneously father or mother, brother or sister, child, worker, believer, voter and athlete. It is useful to think of these different lives and the different roles that we assume as constituting the different 'worlds' that we inhabit.

The notion of 'multiple worlds' suggests clearly discernible 'realities' or 'domains of experience'. It also suggests that each of these 'worlds' has a distinct set of rules and practices. Different codes of conduct apply to each of these worlds, with clear differences in role expectations. The world of the family has certain rules, such as respect for one's parents, care of one's children, acceptance of parental authority and so on. The religious world has other rules and norms: rules of worship, membership criteria and rules associated with different religious practices and rituals such as baptism and communion.

Although we do not physically inhabit different worlds, it is interesting to note that each of our worlds is associated with a clearly distinct 'place': the workplace, the home, the church, the playing field, the gymnasium or the seat of government.

A significant aspect of the different worlds that we inhabit is that each 'world' requires a different kind of knowledge and set of skills and competencies. This means that human beings are typically endowed with a wide range of types of knowledge. Knowledge of the political system and practices obviously differs from religious knowledge. My professional know-

ledge and skills enable me to perform effectively in the workplace. The knowledge of a particular sport and the skills involved in being a top athlete clearly differ from the knowledge involved in running a business.

These examples should not be viewed as a denial of the fact that there might be interesting similarities in skills and knowledge strategies that cut across all of these worlds, but they do emphasise the fact that human beings employ a wide range of types of knowledge and skills in their worlds. The differences between these types of knowledge are directly related to the 'kind of world' of which each type is a central element. Following Alfred Schutz (1962:20), we shall refer to the set of knowledge and skills in a particular world, as a 'stock of knowledge'.

## Elaboration: 'multiple worlds' and 'stocks of knowledge'

### Multiple worlds

The notion of 'multiple worlds' is not new and various writers have addressed this issue, albeit with different emphases. Let us look at two such approaches, namely Wittgenstein's notions of language games and role theory.

Wittgenstein introduced the notion of a *language game* to emphasise the logic that governs our use of words or the rules that govern our ability to 'proceed to the next move'. The analogy is with the games that we play and the rules that apply. For example, if I were to pass you a ball on a certain kind of playing field, you would know what to do next or how to proceed, provided you understood the game or were in fact playing it with me. But according to Wittgenstein, these rules are not fixed: they 'sometimes leave room for doubt and sometimes not' (1988:85). Moreover, 'the application of a word is not everywhere bound by rules: a rule stands there like a signpost' (ibid.). A sign is understood as being part of a certain form or way of life. If I pass a fellow rugby player a ball while playing a match, this move will be understood within the context of this form of life. In another context the same action becomes radically unclear, for example, passing you a ball as we pass each other at a streetcorner. The point is that, more often than not, actions and signs do not have inherent meanings, they only derive meaning within a context of a form of life.

What is important for purposes of our discussion is that each of us participates in a variety of different forms of life, each with its own game rules. This means that certain moves may get us into trouble in certain contexts and not in others or may, at least, mean something different, depending on the context. For example, if I become accustomed to bossing people around in the workplace, and this spils over into the home, my spouse will object on the basis that my behaviour is inappropriate within the context of a shared home. What is accepted as authority in one setting may well be poison in another.

Another way of understanding the notion of 'multiple worlds' is suggested by the sociological theories of socialisation and social roles.

Socialisation may be defined as the process that links the individual to his or her culture or subculture. It is the process by means of which individuals absorb and assimilate the values, customs and traditions of their

society. According to the anthropologist, Ralph Linton, socialisation can be explained in terms of the notions of 'role' and 'status'. *Status* is the position one holds in society, for example, that of judge, teacher, mother, father, son or daughter while the *role* is the behaviour expected of the person who occupies that position.

However well one is socialised into performing a specific role, problems arise in coping with a range of roles – a situation referred to by sociologists as *role strain*. Most individuals experience role strain at some or other time. One type of role strain results from conflicting demands in a particular role. This is referred to as *role conflict*. Role conflict arises in cases when the demands of one role, for example one's professional role, conflict with the expectations that arise from simultaneously being a father or mother, husband or wife, or son or daughter.

## Stocks of knowledge

What are the distinguishing features of our stocks of knowledge? Three features will be discussed briefly: the internal consistency of a stock of knowledge, its collective nature and its historical or traditional dimension.

### *Internal consistency*

The notion of a 'stock' suggests the existence of some degree of internal coherence within a set of beliefs. The elements of what I regard as my stock of moral, political or religious knowledge are linked in some way. There is some degree of 'integration' or 'internal consistency' within a system of beliefs. This does not mean that we do not sometimes hold contradictory beliefs about various matters, but this is more often the case across worlds than within worlds. In other words, although we often hold a certain moral conviction that is quite contradictory to a specific religious belief, it would be more difficult (and stressful!) to hold two contradictory moral or religious beliefs. Let us consider an example. It is quite conceivable that, within the moral domain, I might deny the right of women to choose abortion because it involves killing a human being, while simultaneously, within the political realm, I might believe that it is right to fight for a certain cause and perhaps kill other individuals in the process. It is more difficult, say within the religious world, to accept certain Protestant doctrines, for example, that of original sin, in conjunction with the Catholic belief in absolution.

### *The collective nature of stocks of knowledge*

Although I might hold certain very idiosyncratic and unique beliefs, I share many of my beliefs with other people. This characteristic of 'stocks of knowledge' has some positive features: it makes interpersonal and intercultural communication possible or at least easier, it nurtures feelings of solidarity amongst groups of 'like-minded' people and promotes shared commitments to the same goals. But the 'collective' nature of stocks of knowledge also has negative consequences, such as the role of group pressure in the socialisation process and the associated urge to conform.

In a number of classical studies done in the 1950s, Asch was able to show that individuals tend to conform to the majority decision even if the majority opinion is in fact misguided (cf. Asch, 1951; 1956).

PART

1

*The historical dimension*

Stocks of knowledge develop over time and they change constantly. It is precisely because human beings have the capacity to learn from experience that we continuously adopt new ideas and discard old ones. Some of my beliefs are obviously more strongly entrenched than others. Some are far more important, even crucial, to who I am and what I represent, while others might be held only fleetingly. It is not unusual for many of the beliefs that I regard as being central to what I hold to be my 'stocks of knowledge' or 'belief systems' to be derived from sources outside my personal experience. Some ideas and beliefs stand the test of time and become part of a particular symbolic tradition or culture. With age one adopts the beliefs and opinions that one feels comfortable with, that fit into one's existing body of knowledge.

## Critical reflection and assignment

### On 'multiple worlds'

It is important to remember that the term 'multiple worlds' is used in a metaphorical sense. We obviously do *not* inhabit different physical or material worlds. We all still occupy the same space and time framework. The idea of 'multiple worlds' is used as a metaphor to make a particular point about the differentiation and multidimensionality of people's lives.

What do the following expressions, which all use the image of 'world', tell you about being human?

- We are worlds apart!
- The best (or worst) of all possible worlds.
- Ways of world making.
- All the world's a stage.

### On 'stocks of knowledge'

We have used the term 'stocks of knowledge' to refer to our collections or sets of beliefs? What do the following, equally interesting, images suggest to you about human knowledge?

- Bodies of knowledge.
- Sets or systems of beliefs.
- Cognitive (knowledge) schemes or frameworks.

# 2

# *Kinds of knowledge*

**Central theme**

Three worlds – each with its own stock of knowledge – are distinguished: the world of everyday life (lay knowledge), the world of science (scientific knowledge) and the world of metascientific reflection (metascience).

*Key concepts*

Lay knowledge – folk knowledge – scientific knowledge – metascience – knowledge interests – pragmatic or existential interest – epistemic interest – critical interest.

## Main argument

Each of the worlds that we live in requires a different kind of knowledge. The knowledge required to fix a technical problem in the house differs radically from the knowledge required to solve a problem regarding a relationship with a close friend. The knowledge and skills involved in farming differ from the moral knowledge and insight required to decide between two equally different options or dilemmas. There are many more examples, but the basic point is simple: the different worlds that we inhabit involve quite dissimilar 'stocks' of knowledge and strategies. This is so because knowledge has numerous functions; it enriches our lives in various ways. It broadens our horisons and enables us to understand our world. It helps us to make better-informed decisions and cope more effectively with daily challenges.

For purposes of this book, we shall group the different kinds of knowledge of our everyday life together and refer to them as 'lay knowledge' (sometimes also referred to as 'folk knowledge'). We shall contrast the world of everyday life and lay knowledge with two other 'worlds' that are of particular relevance to scientists: the world of science (and scientific knowledge) and the world of metascience (and metascientific knowledge). The basis for this threefold distinction can be found in what will be referred to as the central *'interests'* (or motivation) that 'drive' the production of knowledge in each of these worlds.

## Elaboration: the three worlds

### World 1: The world of everyday life and lay knowledge

The term 'lay knowledge' refers to the knowledge that ordinary people have. The word 'lay' was originally used to differentiate between 'members of specific religious orders or clergyman', and other people. In this sense the 'laity' referred to the general public.

We use the term 'lay knowledge' to refer to the stocks of knowledge that we use in everyday life and that enable us to cope effectively with our daily tasks. This is the knowledge that we have acquired through learning, experience and self-reflection. Contrary to what the term 'lay' might suggest it is important to emphasise that 'lay' knowledge is in no way any less sophisticated, complex or useful than for instance scientific knowledge.

In point of fact, the terms that we use to refer to different kinds of general knowledge give us an idea of the range and complexity of 'lay knowledge'. Lay knowledge takes on various shapes and forms! We have all encountered a businessperson who has shown keen *acumen* in closing a particular deal; a grandparent or elder who always seems to come up with the most wonderful insights and *wise sayings;* the person who solves a problem through sheer *common sense* and *savvy* and the negotiator who has the *knack* of breaking a deadlock through brilliant insight and understanding of the complexities of group dynamics. In fact, Tony Giddens (1979:144) has justifiably emphasised the importance of what we term *knowledgeability* in people. A knowledgeable person has the knowledge to know both *what* to do and *how* to do it. This is *practical* wisdom in action!

The common denominator in all these examples is a practical interest in solving a particular problem or resolving a certain issue. Most lay knowledge, although not all of it, helps us to cope more effectively with the problems, issues and decisions of everyday life. This is why we use the term 'pragmatic interest' to describe the overriding rationale and motivation of lay knowledge.

The term 'pragmatic' is derived from the Greek word 'pragmein' and 'pragma' (thing or fact) which literally means 'to do'. It has the same roots as 'practice' and 'practical'. The emphasis is on what is done, on outcomes rather than ideas or ideals.

An important implication of 'pragmatic interest' is that usefulness is the primary criterion of what constitutes 'good' or 'worthwhile' lay knowledge. We apply our lay knowledge to solve problems, to reach consensus and to gain understanding and agreement. One could even argue that the ultimate aim of coping in the world by applying such lay knowledge is to ensure a sense of 'ontological security' (Turner, 1990). The point here is that we require knowledge in our everyday life not only to solve technical problems or to make decisions but also *to enable us to live a human life*. The pragmatic interest that drives individuals to acquire lay knowledge could equally well be termed the 'existential interest'. We need knowledge not just for the sake of 'knowing' but actually to live a better life.

'Ontological' means the 'study of being' or 'reality'. It is derived from the Greek word (ontos) which is usually translated as 'being' or 'reality'.

### World 2: The world of science

The distinctive feature of the world of science is that scientists typically 'make' phenomena of World 1 (the world of politics, economics, the physical world, the animal world, and so on) into 'objects' of inquiry and invest-

igation. Although ordinary people also reflect on the nature of phenomena in the natural and social world, it is only in the world of science that these worlds, or more correctly, the 'phenomena in these worlds' are made the objects of *systematic* and *rigorous* inquiry. When, in our everyday life, we reflect on what happens and why it happens, we do not normally subject such reflections to rigorous and systematic testing.

The search for truth is the overriding goal of science. Whereas in everyday life we look for knowledge that will improve our ability to cope with issues, the aim of scientists is first and foremost to generate truthful models and theories of the world. This interest in truth will be referred to as the 'epistemic interest'. In the next chapter we will elaborate on what this means for the practice of science. At this stage it will suffice to make the following general remark: just as the 'pragmatic interest' promotes the acquisition of lay knowledge in World 1, so the 'epistemic interest' permeates the whole process of knowledge production in World 2, the world of scientific research.

'Epistemic' is derived from the Greek word 'episteme', which means 'authentic' or 'true knowledge'. Plato contrasts it with 'doxa', which is best translated as 'mere opinion'. Epistemic interest is hence the interest in attaining true knowledge.

The world of science is not a homogeneous world. There are different sciences precisely because the phenomena that they investigate are multifaceted. The fact that there are natural sciences (physics, chemistry, biology and astronomy), formal sciences (mathematics and logic), social sciences (sociology, psychology, anthropology and political studies) and humanities (history, philosophy and linguistics) is a reflection of the complexity of World 1.

## World 3: The world of metascience

Human beings continuously reflect on what they do. We are self-conscious beings. This is true in World 1, where we regularly subject our own actions and decisions to self-criticism, where we wonder why we decided to do something in a specific way and where we reflect on the rationale or justification for a particular moral or political position.

Meta: From the Greek, meaning 'with' or 'beyond'. As in metaphysics – going beyond or transcending physics. 'Metascience' thus literally means going beyond or transcending science. We use it with the slightly different connotation as 'reflections' on science.

This is even more true of science. In fact, reflections on the nature and dynamics of science have become so sophisticated and complex that, over the past century or so, we have witnessed the development of academic disciplines like philosophy of science, research methodology, sociology of science and history of science. These disciplines have one feature in common, namely that they make the World of Science (World 2) an object of critical inquiry and reflection.

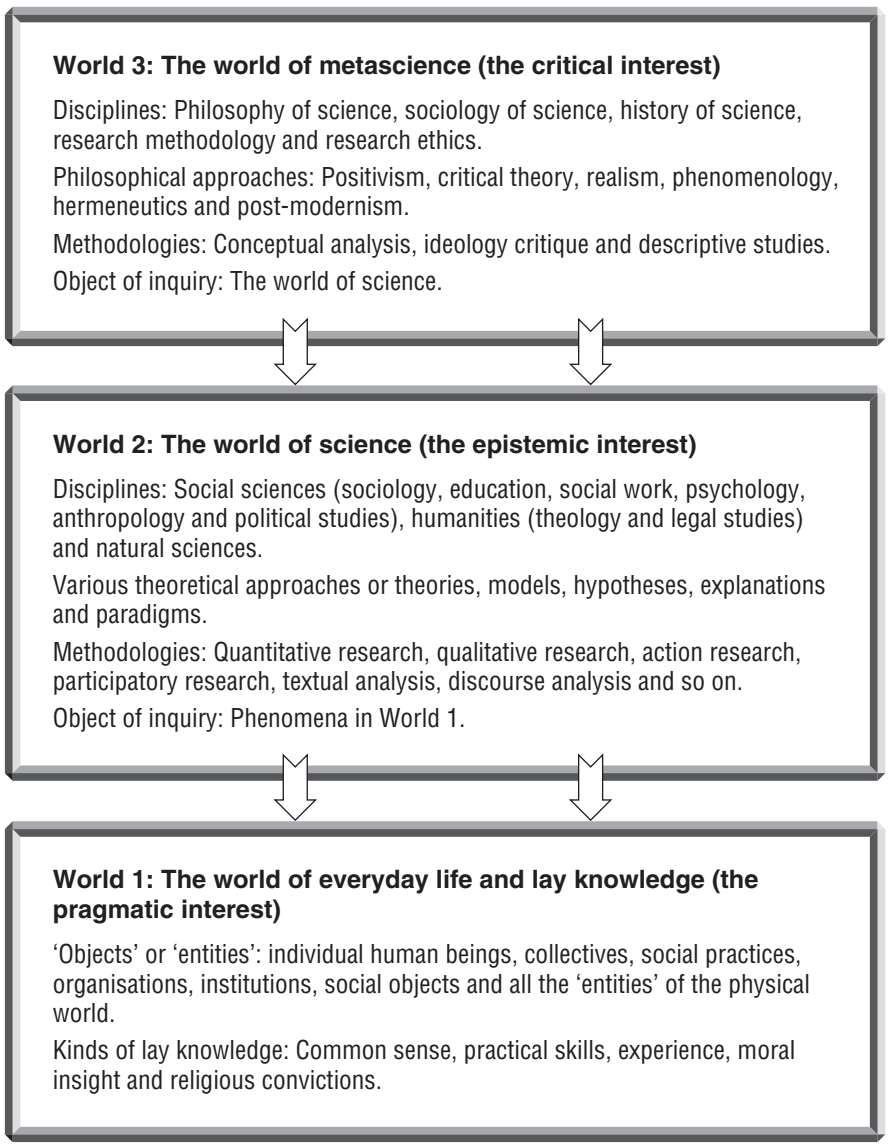
The interest in such reflections is a critical one, which means that, in some way, they aim to criticise, dissect, deconstruct or analyse what scientists do toward the ultimate improvement of science. Here are some examples:

- Studies in the *philosophy of science* generally aim to bring greater conceptual clarity to some of the key concepts in science, including truth, objectivity, validity and progress.

- Studies in the *history of science* provide a historical perspective on the rise and demise of disciplines so that we can learn from our mistakes and also understand the limitations of what we do.
- The *ethics of science* aims to provide guidelines on what constitutes appropriate moral behaviour in the sphere of science.
- The *methodology of scientific research* reflects on scientific research practice, the methods and techniques used by scientists and particularly on the underlying logic of these activities, in order to improve them.

The three worlds, with some distinctive features of each, are schematically represented in figure 2.1.

**Figure 2.1** The three worlds



## Elaboration on the diagram

1. It is important to emphasise that our distinction between the three Worlds is an *analytical* distinction. This means that we distinguish between these three kinds of worlds (or contexts or forms of life or language games) in order to understand what knowledge is – in this case, scientific knowledge. But the fact that this is an analytical distinction does not mean that these worlds embody features that are any less real. These three worlds are still 'inhabited' by real people with concrete beliefs, decisions and actions.
2. Each world has its typical spatial images:
   - World 1: the home, the school, the workplace, the playing field, the pulpit, the courtroom, the factory and the organisation.
   - World 2: the laboratory, the field, the interview room, the archaeological site and the study.
   - World 3: the study and the conference room.
3. Each world reflects time differently:
   - World 1: people grow up, mature and eventually die, schools come and go, social movements rise and fall, fads and fashions come and go, new political parties emerge while old ones disappear and governments are voted into power or overthrown.
   - World 2: the invention of new theories, research programmes, rigorous testing and eventual acceptance or rejection (see also chapter 30 on Kuhn's notion of paradigms and scientific revolutions).
   - World 3: the rise and demise of various philosophical movements or schools. This is signified in our use of terms such as 'post-', as in post-empiricism and post-modernism or 'neo-', as in neo-positivism.

In summary:

- The world of everyday life consists of a multiplicity of worlds which together constitute the ordinary life experience of all individuals. Lay knowledge is characterised by the pragmatic interest, the interest in coping with life's everyday problems and challenges.
- The world of science consists of those academic disciplines (natural, social and human sciences) that make the world(s) of everyday life into object(s) of systematic investigation. Science is driven by the epistemic interest, which is the search for truth.
- The world of metascience consists of the metareflective disciplines (philosophy and sociology of science) that make the world of science into an object of critical inquiry and reflection. Metascience is characterised by the critical interest, which is the interest in improving science.

## Critical reflection

We have not yet discussed the *interrelationships* between the three worlds. Can you think of any examples of social scientific concepts that have become part and parcel of our everyday stock of knowledge?

PART

1

As an assignment, read through some recent newspaper and magazine articles and find an example of social science research reporting. Also reflect on the potential problems involved in 'popularising' scientific results in lay terminology.

# 3

# *Scientific knowledge*

**Central theme**

Science refers to a body of knowledge as a 'product' and to scientific research as a 'process'. We discuss three interpretations of the nature of science: the idea of the house of science (positivism), the image of the body or tree of knowledge (Popper) and the idea of paradigms of knowledge (Kuhn).

*Key concepts*

The growth of knowledge – paradigms – normal science – scientific revolutions – the edifice of science – the body of knowledge – the web of belief.

## Main argument

When we use the term 'science', we usually have two things in mind. On the one hand, we use it to refer to a specific body of knowledge that has evolved over time and has certain features such as validity, internal consistency, explanatory potential and usefulness. On the other hand, we also use the word 'science' to refer to the practices in which scientists are involved, namely scientific research or inquiry. In this case, 'science' refers to activities such as formulating research problems, measurement, experimentation, analysis and theory testing. These two meanings of the word 'science' reflect the very basic distinction between science as a product (scientific knowledge) and science as an ongoing process (scientific research). In this chapter we focus on science as a body of knowledge.

> *As a product or outcome of scientific research, scientific knowledge can be defined as the body of propositions (factual statements, hypotheses, models, theories, laws) which, at a specific time, is accepted by the scientific community (for instance the community of sociologists or psychologists), as being valid and reasonably correct.*

The acceptance or rejection of scientific statements is based on the outcome of ongoing research. It is important to emphasise the fact that the process of accepting or rejecting new knowledge claims is a very complicated and sometimes protracted one. This means that what is accepted at a given time as belonging to the body of 'social science' consists of statements of varying degrees of 'strength'. Some statements have been well

PART 1

substantiated through decades of research, whereas others are tentative and provisional.

Views on how scientific knowledge is generated are closely related to how the 'body' or 'structure' of science is interpreted. We will distinguish between three such views:

- The image of the house or edifice of science (science as the accumulation of true facts that are logically consistent).
- The image of the body or corpus of scientific knowledge (science as the product of an ongoing process of evolutionary growth).
- The image of paradigms of science (science consists of exemplary solutions to problems that arise in the aftermath of the scientific revolutions that are created to solve scientific anomalies).

Irrespective of the specific metaphor that is used to explain the nature of science, all these interpretations aim at understanding the 'unity' of scientific knowledge, that is, the way in which the elements or components of scientific knowledge are related to each other. Science consists of different kinds of components, for example, factual and descriptive statements, explanatory hypotheses and theories, laws and models, various kinds of assumptions and postulates and usually implicitly held beliefs and values as discussed in detail in part 4 of this book.

'Logical positivism' was a school of thought which originated in the 1920s in Austria (as the Vienna Circle). It was the most dominant metascientific tradition until the early 1960s. Its main thesis was that the social sciences should model themselves on the logic and methods of the natural sciences.

Philosophers of science have different views on the degree of interconnectedness of the various components. At the one end of the spectrum we find the logical positivist view that science is an axiomatic or deductive system where all the elements can be deductively inferred from a few core axioms and postulated. At the other end, we find various views that interpret science as a loosely held network or 'web' of related statements.

## Elaboration: images of the structure of science

In 1982 Alan Chalmers wrote a little book on the nature of science with the interesting title: *What is this thing called science?* The history of metascience contains many answers to the following question: what is the structure of scientific knowledge? We shall now discuss, in more detail, three prominent views, each of which is structured around a central metaphor.

### The house/edifice of science (positivism)

One of the oldest interpretations of the nature of scientific knowledge is that of the house of science. We find it in the work of the seventeenth-century philosopher-scientist Francis Bacon and numerous other modern philosophers of science.

For various reasons the metaphor of science as a structure or building is a powerful one. First, it suggests that scientific knowledge ought to be built on solid foundations. These foundations are usually factual statements, which

are more easily verifiable than theoretical statements. Statements that are seemingly irrefutable and indubitable can be regarded as the foundations of the house of science. Statements that are more difficult to verify, such as theories, universal laws and theoretical models are the bricks in the walls of the building and may have to be replaced from time to time. On the whole, however, this interpretation views science as a phenomenon that progresses slowly but surely, as additional bricks become more firmly cemented.

## The body of knowledge (Popper)

In various publications, Karl Popper (1972; 1973) argues that scientific theories grow in an evolutionary way. He borrows terminology from evolutionary theory to make his point. According to him, the history of scientific theories is comparable to the history of humankind. It is a history that is based on 'trial and error' where, in the long run, only the fittest survive. As in the evolutionary process, science progresses only through attempts to falsify or reject new theories. The theories that withstand attempts at rejection emerge stronger at the end of the process and are accepted as part of the body of knowledge. But this acceptance is always provisional, because there is always the possibility that future attempts at falsification might succeed.

Falsification is the term used by Popper to refer to the logical process of trying to prove that a hypothesis is wrong. This is done by showing that the testable instances (or cases) of the hypothesis are not supported by the evidence.

## Paradigms of science (Kuhn)

In 1962, Thomas Kuhn formulated an alternative to the positivist view. On the basis of a detailed study of the history of the natural sciences, he argued that we should distinguish between two clear phases in the history of all disciplines, namely periods of normal science and scientific revolutions. According to Kuhn, the history of science typically consists of a period of normal science (during which a particular research tradition or paradigm dominates) followed by a scientific revolution when the dominant paradigm is rejected. The process is then repeated. Examples are the revolution effected by Einstein in physics, by Darwin in biology and by Copernicus in astronomy. Precisely because science undergoes these stages of normal research and revolutionary upheavals, it is impossible to view it as a process of growth through accumulation.

The notion of a 'paradigm' is derived from the field of language. A 'paradigm' case refers to a model example (an exemplar) which typically provides a solution to some grammatical problem.

Kuhn suggests we view scientific knowledge as consisting of sets of exemplars or paradigms. Dominance of a particular paradigm such as structural functionalism in sociology during the sixties, means that this paradigm dictates the research agenda of the period by defining what problems count as legitimate scientific problems and more importantly, what would constitute acceptable solutions to such problems.

But somewhere along the line even the most successful framework will be faced with problems that it cannot solve and will eventually be replaced by another framework or paradigm. Unlike the positivist interpretation of science as an edifice that is slowly but surely being constructed, Kuhn's

view of science emphasises the fact that science does not grow linearly and accumulatively.

## Some remarks in summary

1. Scientific knowledge consists of propositions or statements with varying degrees of substantiation or empirical support. We will pursue this issue in much more detail in part 4. Suffice it to say that not all scientific statements have the same epistemic (i.e. knowledge) status. Some statements, usually the factual and descriptive ones, are more likely to be true because they have withstood numerous attempts at falsification. Others, usually high-level theoretical statements, are far more tentative and provisional and have still to be subjected to rigorous testing. Although the positivists err in their belief that certain statements are irrefutable and indubitable and can hence never be rejected, this does not mean that some statements are not better substantiated or supported than others.
2. Scientific knowledge does not consist of only testable and well-tested propositions. Science also includes certain untestable statements such as axioms, postulates and presuppositions. Furthermore, as Kuhn has reminded us, accepted scientific knowledge at a given time also includes certain basic commitments and values. We will discuss these in chapter 30 under 'metatheoretical statements'. These statements include beliefs about the nature of the world and human beings, and also about the nature of scientific inquiry *per se*.
3. Finally, all three interpretations of the nature of science emphasise the fact that the various elements of scientific knowledge, namely propositions, assumptions, axioms, values and metatheoretical commitments, are inextricably connected. These interpretations differ with regard to the nature of the interconnections. The logical positivists advocated the view that science is an axiomatic or deductive system. This view was perhaps idealistic rather than scientifically based. Willard Quine uses the provocative image of the 'web' of belief, whereas Mary Hesse refers to 'networks' of propositions. It is probably fair to say that most contemporary philosophers of science, especially in the field of the social sciences, would defend the latter, more 'relaxed' position. In other words, scientific knowledge is more generally accepted as a loosely knit web or 'fabric' where some statements are more closely or logically connected and others are perhaps only indirectly linked or related.

## Critical reflection

Our discussion in this chapter has addressed three issues:

- How science grows (by accumulation, evolutionary process or revolutionary shifts).
- What scientific knowledge consists of (propositions, assumptions, axioms, postulates, values and commitments).
- How the elements of science are connected (close deductive connections or a loose web or network of components).

# 4

# *The nature of scientific research*

**Central theme**

Scientific research or inquiry has been interpreted in various ways. Four notable interpretations, namely the epistemic, sociological, economic and management models are discussed in some detail.

*Key concepts*

Search for truth – epistemic model – sociological model – economic model – management model – professionalisation of science – commercialisation of science – globalisation of science.

## Main argument

In the previous chapter we discussed various interpretations of the nature of scientific knowledge. We now focus on the process of scientific inquiry and ask questions such as the following: What are the distinctive features of the dynamics of the research process? How is scientific knowledge produced and how does it change? What happens during the process of scientific research?

There are many possible interpretations of the nature of scientific inquiry, but we have elected four that have been and are still very influential. A central metaphor or image of research is inherent in each of the interpretations. These are:

- Research as the search for truth (the epistemic model).
- Research as a problem-solving social activity (the sociological model).
- Research as the production of knowledge (the economic model).
- Research as project management (the management model).

## Elaboration: four images of scientific inquiry

### Research as the search for truth (the epistemic model)

The point of departure of this interpretation, which has its roots in Greek philosophy, is that science is a 'search' or 'quest' for truth. But the epistemic interpretation really came to prominence during the early seventeenth century in the works of the British philosopher Francis Bacon

(1560–1625). This new interest can be ascribed to Bacon's analogy between science as a quest for truth and the explorations of the globe that had been undertaken by explorers like Christopher Columbus, Francis Drake and Vasco da Gama. Bacon writes:

> *It would disgrace us now that the wide spaces of the material globe, the land and seas have been broached and explored, if the limits of the intellectual globe should be set by the narrow discoveries of the ancients. Nor are those two enterprises, linked … together in any trivial way. Not only reason but prophesy connects the two* (Redargutio, 131–132).

One of the strengths of this interpretation is that it focusses on the close relationship between the goal of science, to wit, the search for truth, and the road that has to be followed to reach this goal. How one defines the goal of scientific inquiry (the epistemic dimension of science) clearly determines which road or route should be taken (the methodological dimension of science).

The epistemic model reached its most articulate form in the early twentieth century within the school of logical positivism. However, the logical positivists went too far in arguing that the methodological dimension of science could be reduced to the principles of logic. According to this view, scientists typically apply the principles of deductive and inductive logic in the assessment of new hypotheses and this is sufficient to guarantee the 'truth', or at least the 'probability' of theories.

## Research as a problem-solving social activity (the sociological model)

Partly in response to the extreme direction taken by the logical positivists' interpretation and their obsession with logical methods, and partly as a result of their own descriptive studies of the nature of scientific research, a number of people in the sixties developed an alternative interpretation of the nature of scientific research. The best-known figure is certainly Thomas Kuhn (*The structure of scientific revolutions,* 1962), but similar views were shared by Stephen Toulmin and Paul Feyerabend, and David Bloor and Steven Shapin of the Edinburgh school.

In an attempt to 'correct' the one-sided view of science that developed in the early part of the twentieth century in positivist circles, proponents of the 'sociological model' emphasise the fact that scientific inquiry is basically a social practice aimed at solving certain theoretical and empirical problems. Scientists are social actors who follow certain rules, share basic scientific values and work within clearly defined research traditions or paradigms. The focus has shifted from scientific inquiry as the search for truth through objective methodologies. Science is now viewed as a collaborative social activity. The focus is now on scientists and scientific communities and on what they do, believe and value. In fact, Kuhn states in an oft-quoted passage, that if we wish to understand how new theories are accepted or rejected, we need only study the scientific community and what it values. It is only by understanding the nature of the scientific community that we can gain insight into the research process.

## Research as the production of knowledge (the economic model)

Since World War II science has grown and expanded to such an extent that de Solla Price (1963) could justifiably refer to it as 'big science'. Primarily because of the growth in military research during and after the war and the rivalry between the super powers in the area of space research during the Cold War period, science has grown immensely. This is also true of the social sciences. Industrial and psychological research, which investigate the need for selection criteria in industry, have flourished in the aftermath of the war, while educational and sociological research was greatly stimulated in the USA by President Johnson's declaration of a 'war on poverty' in the sixties. Together with technological advances in information and telecommunications technologies, all of these developments have resulted in what is now aptly called the 'research industry'.

This has given rise to a predominantly economic interpretation of the nature of scientific research. Within this paradigm, science is viewed as a manufacturing or production process (Knorr-Cetina, *The manufacture of knowledge,* 1981). In this process, scientific knowledge is increasingly seen as another commodity on the market. Like any other commodity, knowledge has a certain price or value. The production or manufacture of knowledge requires certain resources or materials; it has to be well packaged and marketed in order to sell well. Scientists are compared to 'knowledge-workers' (Stehr, 1994). Even if it is with a sense of nostalgia, one can refer to the commodification and commercialisation of science!

A commodity is a thing produced for use or sale, an article of commerce, an object of trade. The 'commodification' of knowledge then literally means transforming knowledge into objects that have an exchange value or price!

## Research as project management (the management model)

The management interpretation is, in a sense, a variation on the economic model. Instead of viewing science in manufacturing or production terms, it uses another approach of modern economies, namely the management approach. In this model, scientific research is interpreted as a business venture that has to be properly managed if it is to deliver the goods required. In managerial terms the scientist is viewed as someone who has to acquire the business acumen and skills that are required for success. These are research and project management skills and would typically involve the management (organisation, planning, implementation and control) of a range of resources (information, human resources, time, finances and infrastructure).

## Some summary remarks

1. Each of the models has a different image of a scientist. The epistemic interpretation views the scientist as a lone, sometimes eccentric individual, who relentlessly searches for the truth. In the sociological model, the focus is on the collective and social nature of all research, where

researchers are viewed primarily as people who work within the framework of a dominant research paradigm. The economic model focusses on the scientist as a 'worker' or, perhaps somewhat more acceptably, as an 'entrepreneur' who utilises certain resources and tools to produce a specific commodity at a set price for a specific market. And finally there is the image of the scientist as a manager of resources: someone who is expected to have certain managerial skills in order to perform effectively.

2. One way of looking at these four models is to view them as complementary interpretations of scientific inquiry. In this sense, they ought not to be seen as mutually exclusive, but as models which, each in its own way, alert us to the fact that science is a multidimensional phenomenon. It is too often the case – and this has been a feature of debates in the World of Metascience – that a specific interpretation is presented as the only correct one: science is *merely* a truth-seeking journey *or* science is *only* a social activity.

   The view that will be defended in this book is that these models should be viewed as complementary interpretations of scientific inquiry. The different models are useful because they make us aware of the multidimensionality of scientific research. Although we shall argue that the epistemological dimension is the fundamental dimension of science, which means that, first and foremost, research is a search for the truth; we will also argue that science is a social activity and that resource and management issues are important.

3. Although these models constitute complementary interpretations, they simultaneously reflect a real shift in the nature of scientific inquiry. In the Middle Age monasteries, and even during the sixteenth and seventeenth centuries, scientific research was conducted by individual researchers working on their own. However, three developments over the past two centuries have led to fundamental changes in the nature of scientific inquiry:

   – The large-scale professionalisation and institutionalisation of science. The growing number of professional societies and governing bodies has resulted in the full-blown professionalisation of science. Simultaneously, science has increasingly been practiced at academic institutions.

   – The increasing commercialisation of science, which was stimulated by World War II, and further accelerated by space research.

   – The globalisation of science: the exponential growth in information and telecommunications technology has resulted in the globalisation of science. Disciplinary, institutional and national boundaries are continually becoming less relevant.

These three developments have fundamentally affected the way in which scientific research is done. It is no longer possible to define research solely and wholly as an epistemic endeavour that is pursued by committed individual scientists. Science has become a global enterprise that is similar to

business ventures and economic organisations. In our discussion in the next chapter, we shall develop a framework that takes all of these dimensions into account.

## Critical reflection and assignment

Let us look at 'globalisation' in action. As some of you might know, it is now possible to communicate with scholars worldwide through the electronic network Internet. If you are interested in what other scholars are doing in a particular field or if you require assistance with a specific enquiry, you need only send a general message on Internet and the chances are that you will receive many responses.

One way to become a member of a larger interest group or research community is to subscribe to a listserver. A listserver is simply a kind of mailbox shared by a group of scholars. Once you are a member of a listserver, you can exchange messages with all the other members of that particular listserver.

As a member of several listservers, I have observed with growing interest an interesting phenomenon that may impact fundamentally on social research organisation in the future. An increasing number of researchers (and especially post-graduate students), send requests to the listserver for assistance with their projects. The example of such a request cited below, together with some of the responses, is typical:

Date: Sat, 11 Nov 1995 14:44:49-0500
Reply to: Qualitative Research for the Human Science
From: William Francis Northey <northey@BGNET.BGSU.EDU>
Subject: Re: a modest proposal
To: Multiple recipients of list QUALRS-L <QUALRS-L@uga.cc.uga.edu>

On Fri, 10 Nov 1995, Diane Hovey wrote:

Bob,

I was attempting to write up the data from some recent interview – first presenting an objective view of the interview data, then moving to my interpretation. I just dumped writing yesterday and started over because I could not find any way of representing the data without interpretation. It seems to me that every step of the process, beginning with the topic is a form of interpretation.

I was blessed to have discovered Harry Wolcott's book Transforming Qualitative Data published by Sage. Wolcott disposes of the concept of 'objectivity' when it comes to transforming qualitative data, but makes a distinction between the amount of interpretation that can be used. He

points out that not interpreting is impossible. Rather, he suggests that researchers may use varying levels of interpretation or abstraction. The three concepts he uses are 'description', 'analysis' and 'interpretation'.

'Description' addresses the question, "What is going on here?"

'Analysis' addresses the identification of essential features and the systematic description of interrelationships among them – in short how things work.

'Interpretation' addresses processual questions of meanings and contexts: "What does it all mean?" "What is to be made of it all?"

These distinctions helped me and freed me from trying to achieve some goal of 'objectivity' that has a tendency to make me crazy.

Bill

| | |
|---|---|
| Date: | Sat, 11 Nov 1995 16:00:41-0500 |
| Reply to: | Qualitative Research for the Human Science |
| From: | 'Barbara L Stone' <blstone@NANDO.NET> |
| Subject: | Re: a modest proposal |
| To: | Multiple recipients of list QUALRS-L <QUALRS-L@uga.cc.uga.edu> |

On Sat, 11 Nov 1995, William Northey wrote:

This is a very useful discussion. We should also think about the concept that ALL research involves some kind of interpretation, beginning with exactly how the questions are asked. I was once called by the Gallup people, who asked if my milk buying habits had changed because of the addition of bovine growth hormone. Well, my answer had to be no because no one in my family buys milk and we didn't buy any before. Hence, no change. So my answer helped prove that I didn't care that bgh had been added.

The subject of writing questions and bias is addressed more formally in Jagger, A.M. "Sex inequality and Bias in Research" Canadian Journal of Philosophy, Supplementary volume 13, pp. 25–39. (I hope this is enough of a reference. It's all that's on the copy I have. It's sometime after 1988.)

Barbara

**Notes:** In this example, we have an example of a person (Diane Hovey) who put a request on the Internet on Friday the 10th of November. There was an immediate response from Bill Northey (Saturday 11th of November at 14h44), which was followed by another response from Barbara Stone at 16h00 on the same day. It is remarkable that this interchange was conducted across the globe within one day.

After having read this, write a short essay in which you address the following questions:

- How do you think increasing electronic networking, as one form of globalisation of research, will impact on research supervision in the future? What are the positive and negative consequences of such developments?
- What are the implications of these developments for the issue of 'access' to experts? Is this a sign of true 'democratisation' in science or perhaps of the creation of a new elite?
- How will developments like these affect dissemination of research findings? And what are the implications for issues such as copyright, peer evaluation, blind refereeing and citations?

Here are a number of listserver addresses in the field of research methodology (together with the subscription statement) that you might like to explore:

1. Listserver on Qualitative Research. Send an e-mail message to: LISTSERV@UGA.CC.UGA.EDU.
   In the body of the message write: SUBSCRIBE QUALRS-L.
2. Listserver on Public Opinion Research.
   Send an e-mail message to POR&LISTSERV.UNC.EDU.
   In the body of the message write: SUBSCRIBE POR *your first name your last name*.
3. Listserver on Qualitative Data Analysis Software.
   Send an e-mail message to: MAILBASE@MAILBASE.AC.UK.
   Send in the body of the message the following: JOIN QUAL-SOFTWARE *your first name your second name*.

# 5

# *Research as a journey*

**Central theme**

It is useful to compare scientific research to travel. A journey, and also scientific inquiry, has at least four facets or dimensions: a traveller, a destination, a route and a mode of travel.

*Key concepts*

Epistemology – methodology – ontology – sociology.

## Main argument

The main thrust of this chapter is that the analogy between scientific research and undertaking a journey – as suggested by the notion of a 'quest' or 'search' for truth – provides a very fruitful metaphor. In 'unpacking' this metaphor, we begin by identifying the basic elements of all journeys.

A person undertakes a journey with a specific purpose in mind, for example, a business trip to New York or a vacation to the Kruger National Park. A journey has a point of departure and a destination and the area traversed between these two is called the route. In order to reach one's destination, some means of transportation like a car, plane or boat is required. One could add that all journeys require certain resources: time (the journey takes place within a specific time frame), finances, material resources like food and clothing and information about the route and the destination and, in some cases, also additional human resources like a pilot or a chauffeur.

Taking the metaphor of 'research as a journey' seriously, sheds some light on the nature of research. In the second half of the chapter, and in more detail in the subsequent four chapters, we argue that the same four components that constitute a journey, namely the traveller, the destination, the route and the mode of transport, are part of any research project. In the world of science, these components are the researcher(s), the goal, the object of inquiry and the methodology that has to be followed.

## Elaboration: dimensions of journeys

### Travellers and different kinds of journeys

People travel for various reasons, depending on their particular interests and motives. Consider the differences between the following examples:

- The pioneer explorers who first circumnavigated the globe in the sixteenth century compared to the pioneer astronauts who landed on the moon in 1969.
- A family setting out on a leisurely trip to the Kruger National Park compared to a highly stressed businessman travelling to New York to clinch a multimillion business deal.
- The group of pilgrims travelling to Mecca compared to the national soccer team going to the World Cup.

## Different destinations or outcomes

The purpose determines the kind of journey and hence also the destination. It is also true that all people aim to reach their destinations, and hopefully also as planned. You would claim to have had a successful trip if you had reached your destination as planned, within a certain time frame, budget and so on.

## About the route

No-one can decide on a particular route or on the appropriate means of transportation without any knowledge of the destination. There are some exceptions for instance where a journey is undertaken with the explicit purpose of exploring the unknown, as was the case with the pioneers of yesteryear and contemporary astronauts.

This means that the kind of journey is also determined by existing knowledge about the destination and, by implication, also of the route. The more you know about where you are heading and how to get there, the more planning you can put into the journey. The less you know, the more you have to allow for the unexpected, and the less rigid and fixed your itinerary or journey planner can be.

> "Come, it's pleased so far", thought Alice, and she went on. "Would you tell me, please, which way I ought to go from here?"
> "That depends a good deal on where you want to get to", said the Cat.
> "I don't much care where", said Alice.
> "Then it doesn't matter which way you go", said the Cat.
> "– so long as I get *somewhere",* Alice added as an explanation.
> "Oh, you're sure to do that", said the Cat, "if only you walk long enough".
>
> Lewis Caroll, *Alice's Adventures in Wonderland.*

## Modes of transport

The choice of mode of transport is determined by one's destination, knowledge of the route and by the purpose of the journey. Let us consider some examples.

- If I wish to go to London to attend a conference and I have to be there in two weeks' time and I know that there are flights available, I will undoubtedly choose to go by plane. Of course I must also decide how to get to the airport from my home and from Heathrow Airport to Central London. Having arrived there, factors such as time and my knowledge of the available modes of transport will determine my choice in this regard.

- On the other hand, if I choose to embark on an exploration of the Sahara desert, I might decide to travel overland, perhaps by four-by-four landrover, then by camel and even do part of the journey on foot! Again, considerations of time, finance and knowledge about my journey will determine my choice of transport.

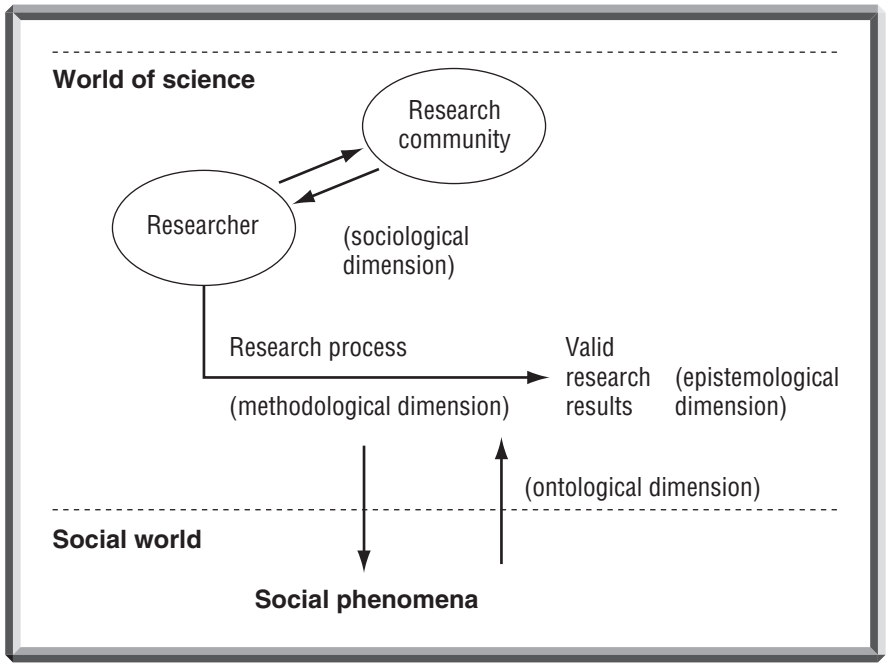
In summary then, a journey has the following four main dimensions:

- The *traveller,* who has a certain motive or reason for undertaking the journey and has certain resources at his/her disposal.
- The *destination.*
- The *route,* which is defined by the destination in relation to the point of departure.
- The appropriate *mode of travel or transport.*

We would argue that the same elements are present in scientific inquiry:

- The *scientist* (traveller) who conducts research for various reasons also has a certain motive in addition to certain resources, including people, time, finance and infrastructure at his/her disposal.
- The *research objective* or goal of producing valid and truthful knowledge (the destination).
- The *phenomenon or aspect of the social world to be investigated* (or terrain to be traversed).
- The *methodologies* to be employed or the route and appropriate modes of transportation).

**Figure 5.1** The multidimensionality of science



In the remainder of the book we shall refer to these four elements or dimensions as the *sociological, epistemological, ontological* and *methodological* dimensions of research.

## Critical reflection and assignment

The metaphor of 'research as a journey' has not yet been exhausted. There are other interesting similarities that can be explored in more detail. The list below refers to other features of a journey that have not yet been discussed. As an assignment, write a short paragraph on each of these aspects as they apply to research:

- Travellers often have a range of maps and guidebooks at their disposal. Discuss the comparable application in research.
- When embarking on a complicated journey where the risk is high, it is customary to work out a detailed itinerary or journey planner. What do you regard as the researcher's 'journey planner'?
- Various factors in the immediate and broader environment can influence a journey. List some of these factors and show their applicability to the realm of research. Consider various kinds of physical and social environments.
- How can timing affect a journey? And how would you apply this to research?

# 6

# *Research as the pursuit of valid knowledge (the epistemological dimension)*

**Central theme**

Scientific inquiry is driven by the search for 'true' or at least 'truthful' knowledge. The predominant purpose of all research is to arrive at results that are as close to the truth as possible, i.e. the most valid findings possible.

*Key concepts*

Truth – epistemic imperative – pseudo-scientific approximations to truth – goodness of fit – validity – plausibility.

## Main argument

We shall expand on the analogy of the journey presented in the previous chapter to argue that the goal or destination of all social inquiry is to produce knowledge that is as close as possible to the truth. Although the notion of 'truth' is complex, scientists are either explicitly or implicitly committed to its pursuit. And even though, more often than not, it is impossible to attain truth, the goal of truth acts as a 'regulative principle' from which scientific inquiry derives its peculiar nature and which distinguishes science from other forms of knowledge production.

A 'regulative principle' is a principle that cannot be proved (so it acts as a postulate) but nevertheless guides human thought and conduct.

We wish to capture this commitment to the 'search for truth' in the notion of 'the epistemic imperative'. I apply the term 'epistemic' in the original Greek sense, which means 'truthful or certain knowledge', knowledge that is well substantiated (as opposed to opinion) and hence provides us with an accurate representation of reality. The term 'imperative' implies a kind of 'moral contract' willingly entered into for the sake of the greater good. The 'epistemic imperative' hence refers to the intrinsic moral and binding character that is inherent in the pursuit of 'truthful knowledge' (cf. also Mouton, 1994b).

But the fact of the matter is that the search for truth, the endless pursuit

of true knowledge, is an elusive ideal. It involves the pursuit of a goal that, in an important sense, can never be realised. It is so that there are powerful factors that make it extremely difficult, if not impossible, to attain this goal. Our analogy of the journey can shed some light on why this is so. We could identify at least three kinds of 'obstacles' that might prevent a traveller from reaching his goal or destination:

- Certain shortcomings that are related to the traveller, for instance lack of knowledge about the destination or route, lack of experience of the particular mode of transport or poor judgement in the selection of the route or in consulting with inexperienced travellers.
- The terrain that has to be traversed might be literally impassable or at least extremely difficult to negotiate. Actual 'pitfalls', 'potholes' or 'obstacles' in the domain could mean that the traveller may fail to reach his/her destination on time or within the planned budget and as a result would fail to achieve his/her goal, in this case to negotiate a business deal by a certain deadline.
- The means of transport might break down because it is defective or because it was the wrong kind of transport for the particular route in the first place. Or less seriously, the means of transport chosen, say a car or boat, is not the most suitable one for that particular journey and might result in late arrival at the destination.

These three kinds of 'obstacles' prevent us from reaching our destinations. In the research game this translates into certain constraints that the sociological, ontological and methodological dimensions of science place on the attainment of truth.

*Sociological constraints* are shortcomings that originate with the researcher(s). These might involve lack of knowledge about the object of the inquiry which is exacerbated by poor review of the literature, lack of training in research practices, lack of experience in conducting research, strong prejudices that might bias the interpretation of the data, and poor judgement about various decisions in the research process.

*Ontological constraints* are features of the 'object of study', that is, certain aspects of the social world. This could include the complexity of human behaviour, the fact that most social actions and events take place in open systems which means that, strictly speaking, it is impossible to predict future behaviour. Another difficulty is related to the fact that certain aspects of human behaviour (moral/emotional/spiritual) are extremely difficult to observe or measure systematically.

*Methodological constraints* refer to the use of inappropriate methods and techniques that ignore the limitations that are peculiar to a particular approach or instrument, and so on.

In summary then, attainment of the epistemic ideal of truth is the overriding ideal of all knowledge production in the social sciences. In real, concrete research we usually have to be satisfied with somewhat less than the ideal, namely attaining results that are more or less close to the truth. In other words, we have to settle for results that are better or worse *approxima-*

*tions* of the truth. For these reasons it has become standard practice in social research to substitute terms such as 'validity' and 'goodness of fit' for the term 'truth'.

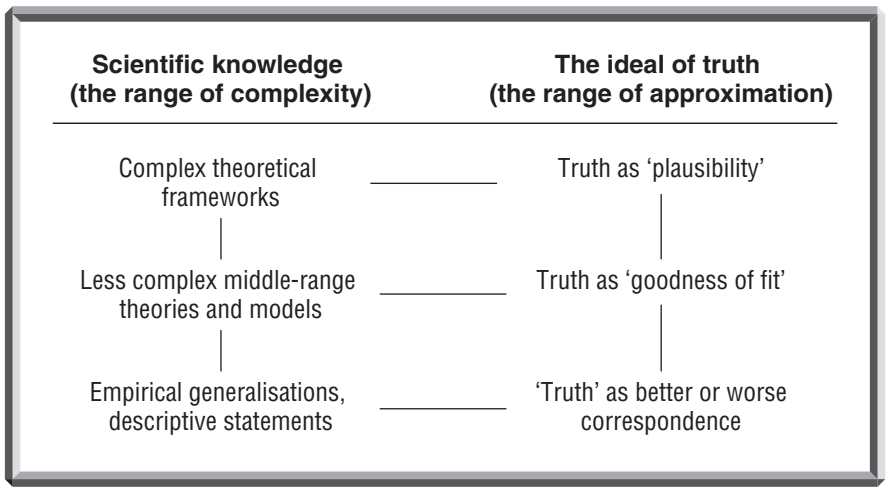
## Elaboration: Validity and goodness of fit

The notions of 'validity' and 'goodness of fit' allow for degrees. These notions capture the idea that a statement or collection of statements can in fact be more or less truthful. Less complex factual and empirical statements can hence constitute a 'good fit' with the real state of affairs, whereas highly complex theoretical systems have only a 'loose fit' with the social world. Some examples might serve to clarify this statement.

The results of a controlled experiment or sample survey of a specific factual situation, like the scores on psychometric tests or the proportion of a sample who hold certain attitudes, often reflect the real situation quite truthfully and it is usually not difficult to validate such results. In the social sciences, repeated measurements over time have confirmed the strong relationship between positive self-concept and scholastic performance, between social class and political attitudes, between personality type and job performance.

However, in the area of explanation and the development of hypotheses and models to investigate the causes of certain kinds of social phenomena, the 'fit' between such models and theories and the social world is much looser. It is far more difficult to determine how valid or close to the 'truth' complex explanatory frameworks are. In fact, we then tend to use other terms to signify the difficulty of establishing 'validity' and 'goodness of fit' in such cases: terms such as 'plausibility' and 'credibility'. For instance, we may claim that Freud's theory of the unconscious or Marx's theory of alienation are highly plausible theories, meaning that they provide coherent and credible explanations for certain kinds of behaviour. We may simultaneously label other theories or hypotheses as less plausible or credible explanations.

**Figure 6.1** Scientific knowledge and the ideal of truth



The point about using terms such as 'validity', 'goodness of fit' and 'plausibility' is that they allow for a whole range of possibilities. Truth is an absolute notion. A statement is either true or false. And although we need the notion of truth as a regulative ideal, a goal to aspire to, we also need other terms such as validity and plausibility to cover the range of possibilities that typically occur in concrete social research when we fall short of the ideal.

## Elaboration: the epistemic imperative

The search for truth is not just another option or a matter of choice. Scientists who are engaged in scientific research are bound, as it were, in a 'moral contract' to commit themselves to the search for truth. In fact, violation of this imperative implies total rejection or suspension of the notion of 'science'. This is another way of saying that the terms 'science' and 'truth' are intrinsically linked. We would argue that once we relinquish the ideal of truth, we no longer have the right to claim that we are involved in the game of 'science'.

It should be emphasised that 'the epistemic imperative' entails more than simple acceptance of the ideal of truth in the production of scientific knowledge. All kinds of knowledge – everyday knowledge, moral knowledge and religious knowledge – work with an implicit notion of truth. In science the idea of an 'imperative' distinguishes the search for truth from other kinds of discourse.

I believe that commitment to the epistemic imperative provides the best explanation for the distinguishing features of science. It explains for instance why rules of evidence and validation are accorded far more priority in science than in any other sphere of human knowledge. There is no other domain of human knowledge in which we place such strong emphasis on following methodological rules and in which we value notions of objectivity and rigour as we do in scientific research. There is no other domain of knowledge in which we accord the development of increasingly sophisticated methodologies such high priority.

The pervasive influence of the epistemic imperative also manifests itself in the social arrangements that are peculiar to science and to the organisation of science. The fact that the scientific community places such a high premium on public scrutiny, open debate, peer evaluation and scientific honesty is not accidental. These are control mechanisms, checks and balances, to ensure the protection of the epistemic imperative. This is why scientists who deliberately violate the imperative through plagiarism or fraud are immediately 'excommunicated' from the scientific community. This is also why the deliberate abuse of scientific knowledge for ideological reasons, as in eugenics and the Velikovsky case, is so vehemently criticised by the scientific community.

These two examples illustrate how acceptance of the epistemic imperative has led scientists to place an equally high premium on objectivity in research (a methodological value) and rational discourse within the scientific community (a sociological value). Because these two notions are intimately linked to the notion of truth and hence to our understanding of how

PART 1

the epistemic imperative functions in science, they will be discussed in more detail in subsequent chapters.

## Critical reflection and assignment

In the reading below, Martin Gardner discusses examples of pseudo-science, which is research that claims the status of science but is not generally accepted as such by the scientific community. Study the reading and write a short essay in which you contrast the worlds of *science* and *pseudo-science*.

### HERMIT SCIENTISTS

"The creation of dianetics is a milestone for man comparable to his discovery of fire and superior to his invention of the wheel and arch". This is the modest opening sentence of L. Ron Hubbard's book *Dianetics: the modern science of mental health.*

An engineer and writer of science fiction, with no status whatever in psychiatry, Hubbard has created all by himself what he and his followers believe to be a revolutionary science of mental therapy. Already, dianetics threatens to become a cult of wide proportions, especially in Los Angeles, and no less distinguished a scholar than Frederick L. Schuman, professor of political science at Williams College, has become an enthusiastic convert. In a letter to the *New Republic* (September 11, 1950) protesting an unfavorable review of *Dianetics,* Schuman wrote, "Not the book, but the review, is 'complete nonsense,' a 'paranoiac system' and a 'fantastic absurdity'. There are no authorities on dianetics save those who have tested it. All who have done so are in no doubt whatever as to who is here mistaken".

There is no need to go into the weird mixture of myths which form the core of Hubbard's book, except to point out in passing that it revives the ancient superstition that experiences of the mother can leave an impress on the mind of a foetus within a day after conception. "What's that chronic cough?" Hubbard asks in his first published article on dianetics (*Astounding Science Fiction,* May, 1950) and the answer, "That's mama's cough which compressed the baby into anaten (Hubbard's term for unconsciousness; derived from the words *analytical* and *attenuation* ) five days after conception … What's arthritis? … Foetal damage or embryo damage." And so on *ad nauseam.*

A few months before Hubbard's revelation, the Macmillan Company published Dr. Immanuel Velikovsky's *Worlds in collision.* The book throws together a jumbled mass of data to support the preposterous theory that a giant comet once erupted from the planet Jupiter, passed close to the earth on two occasions, then settled down as Venus. The first visit to the earth of this erratic comet was precisely at the time Moses stretched out his hand and caused the Red Sea to divide. The manna which fell from the skies shortly thereafter was a precipitate, fortunately edible, of suspended elements in the celestial visitor's tail. Later the comet's return coincided with Joshua's successful attempt to make the sun and moon stand still. The miracles of both Moses and Joshua were the result, Veliscovsky informs us, of a temporary cessation of the earth's spin.

Although Velikovsky's work is a tissue of absurdities, and has been recognized as such by every geologist and astronomer in the country, it is astonishing how many people who reviewed the book were caught off guard by the author's persuasive rhetoric. John J. O'Neill, science editor of the *New York Herald Tribune,* described the book as 'a magnificent piece of scholarly historical research'. Horace Kallen, a distinguished editor and author, wrote, "The vigour of the scientific imagination, the boldness of construction and the range of inquiry and information fill me with admiration". Ted Thackrey, editor of the

*New York Compass,* suggested that Velikovsky's discoveries "may well rank him in contemporary and future history with Galileo, Newton, Kepler, Darwin, Einstein …" And the book was enthusiastically endorsed by Clifton Fadiman and Fulton Oursler.

In view of the astonishing sales of the Velikovsky and Hubbard books, both totally without scientific merit, we may well ask ourselves if we are slipping back into an era of lurid and irresponsible science reporting. Perhaps the most alarming indication of this trend is the current widespread acceptance of the theory that flying saucers are spaceships from another planet. *True* magazine broke the news that the discs were piloted by Martians, but Frank Scully's recent best-seller, *Behind the flying saucers,* argues elaborately that they were flown here with the speed of light by inhabitants from Venus, who are exact duplicates of earthlings except that they are midgets three feet tall.

Although one may censure publishers and magazine editors for printing such incredible nonsense without seeking evaluation by competent scientists, the primary cause of the new flowering of pseudoscience seems to be a hunger on the part of a gullible public for sensational science news. The sudden success of atomic research, hitherto the subject matter of science fiction, is certainly a major factor in this trend. After splitting the atom, nothing seems surprising any more. In addition, wide-spread anxiety caused by fear of atomic war, together with other factors, seems to be turning the minds of countless frightened people toward religion and/or mental therapy. It is not hard to understand the mass appeal of dianetics, which offers a quick, relatively inexpensive, and painless short-cut to psychoanalysis; or the widespread interest in Velikovsky's theories which reestablish the historical accuracy of the Old Testament for orthodox Catholics, Protestants and Jews.

What about the authors of these two masterpieces of pseudoscience? Are they deliberate hoaxers, out to make a dishonest dollar, or are they sincere in believing their own theories? In Velikovsky's case, unquestionably the latter is the truth. Occasionally a carefully planned hoax has fooled the public for a time, such as the famous Moon Hoax of the *New York Sun* in 1835, but such pranks are short-lived and soon exposed. Of a different character altogether is the work of the self-styled scientist, incompetent in his field, but living under a delusion of greatness and driven by unconscious compulsions to create off-trail theories of incredible complexity and ingenuity.

When Renaissance science first began to free itself from metaphysical biases, it was the rule rather than the exception for courageous pioneers to find their work greeted with derision by their colleagues. Galileo had to battle not only church authorities but fellow scientists who were more preoccupied with Aristotle than with an experimental determination of how the world did, in fact, behave. As Aristotle's scientific authority declined, however, opposition to new ideas in science became more and more confined to areas where science clashed with Christian doctrine. Since the turn of the century, even this area of conflict has become remarkably small, and widespread opposition by scientists to a legitimate theory, based on verifiable evidence and cogent reasoning, is an increasing rarity. For a contemporary scientist, often the quickest way to fame is to overturn a widely held theory. Einstein's work on relativity is an excellent illustration of how easily a revolutionary hypothesis can meet with almost immediate serious response, careful testing and ultimate acceptance. Of course there are exceptions, and there are always borderline areas where confirming evidence remains so debatable as to leave eccentric theories in legitimate dispute (for example, Sheldon's work on body types and large sections of psychiatry). But, if anything, science today leans backward in the friendly consideration of bizarre hypotheses.

Outside and quite apart from the cooperative process of communication and testing that goes on constantly within every branch of science, there are the lonely, isolated, hermit scientists. If their knowledge is meagre and their I.Q. low – as in the case of the late

Wilbur Glenn Voliva of Zion City, Illinois, who believed the earth shaped like a pancake – they seldom achieve a following among the general public and are widely recognized as crackpots. If they are victims of sufficiently intense paranoid drives, they may be confined to mental institutions where they potter around perfecting perpetual motion machines and methods of trisecting angles; or writing unreadable, neologistic treatises on the inner secrets of the universe.

Occasionally, however, a milder paranoia combines with a brilliant, creative intellect. In such cases, the self-styled scientist's belief in his own greatness, together with his tendency to interpret lack of recognition as a form of persecution by stubborn and prejudiced authorities, effectively bars him from the social give and take of the scientific process. He retires like a hermit within his laboratory or study, to emerge later with tomes of vast erudition, usually written in a complex jargon of invented terms and phrases. Around the Master will cluster a group of ardent admirers – either disciples whose own psychological demands find identification with those of the Master, or simply naïve cultists who lack the knowledge to penetrate the Master's self-deceptions.

Classic works in the genre of pseudoscience fall broadly into two classes. There are those which have as a major purpose the rationalization of a religious dogma (such as Velikovsky's defence of the orthodox Jewish interpretation of Old Testament history) and the nonreligious theories (such as Hubbard's) which are a pure product of the author's delusions of scientific competence. Because the fantastic views of Velikovsky and Hubbard have been, and will continue to be, dissected elsewhere, it may be of interest to take a look at the works of two other hermit scientists, one religious and one nonreligious, whose contemporary theories in many ways resemble those of Hubbard and Velikovsky but which are even more ingenious examples of scientific self-delusion. In doing so, we may catch something of the pretentious atmosphere and the paranoid flavor which pervade such works …

Gardner, M. 1981. *Science: good, bad and bogus.* Oxford University Press.

# 7

# *Research as methodical and systematic inquiry (the methodological dimension)*

**Central theme**

Research involves the application of a variety of standardised methods and techniques in the pursuit of valid knowledge. Precisely because scientists aim to generate truthful knowledge, they are committed to the use of objective methods and procedures that increase the likelihood of attaining validity.

*Key concepts*

Methodology – method – procedure – techniques – methodological paradigm – quantitative methodologies – qualitative methodologies.

## Main argument

Whereas the epistemological dimension addresses the question of what constitutes knowledge, the methodological dimension is concerned with the questions: How do we attain knowledge? How do we ensure that we reach our research goal?

There is a close means-end relationship between the methodological and epistemological dimensions. In everyday life, what we define as the goal of a certain action will usually, though not always, determine the choice of means to attain that goal. Similarly, the choice of the most appropriate methodology is largely determined by the epistemic ideal or goal that is set for science .

The term 'methodology' is derived from the Greek words 'methodos' and 'logos' (logic or study). The term 'methodos' in turn is made up of two words: 'meta' meaning 'alongside' and 'hodos' meaning either 'a road' or 'journey'. 'Meta-hodos' literally then means 'alongside the road' and metaphorically, the means or method of doing something.

## Elaboration: technique, method and methodological paradigm

The methodological dimension refers to the 'knowledge of how' or 'know-how' to do things or the total set of 'means' that scientists employ in reach-

ing their goal of valid knowledge. We refer to these means by various names such as methodologies, research approaches, methods, techniques, procedures and instruments.

It is useful to distinguish between three levels of the methodological dimension. These levels differ in terms of complexity and level of abstractness. We will discuss them under the headings 'research techniques', 'research methods' and 'methodological paradigms'.

## Research techniques

At the most concrete and least complex level we find tangible or observable instrumentation (techniques, procedures and skills) that are used in social research. These are the social scientist's 'tools'. Research techniques can be defined as the specific and concrete means that the researcher uses to execute specific tasks. Such tasks are of course related to specific stages in the research process, such as sampling, measurement, data collection and data analysis.

So, for instance, 'simple random sampling' would be referred to as a technique for sampling subjects. Similarly, 'telephone interviewing' would be referred to as a specific kind of interviewing technique used in survey research. In the domain of statistical analysis there are literally hundreds of techniques. Again, these would be classified under certain clear headings such as ANOVA as a technique to analyse group differences and CHAID as a technique for exploratory analysis of categorical data.

## Research methods

In this book the term 'method' will be used to refer to a higher level of abstraction of research means. Specifically, we shall use the term research methods to refer to the means required to execute a certain *stage* in the research process. This leads us to the following classification:

- Methods of definition: theoretical and operational definitions.
- Sampling methods: probability and non-probability methods.
- Measurement methods: scales, questionnaires and observation schedules.
- Data-collection methods: participant observation, interviewing, unobtrusive measurement and systematic observation.
- Data-analysis methods: statistical methods, mathematical methods and qualitative methods.

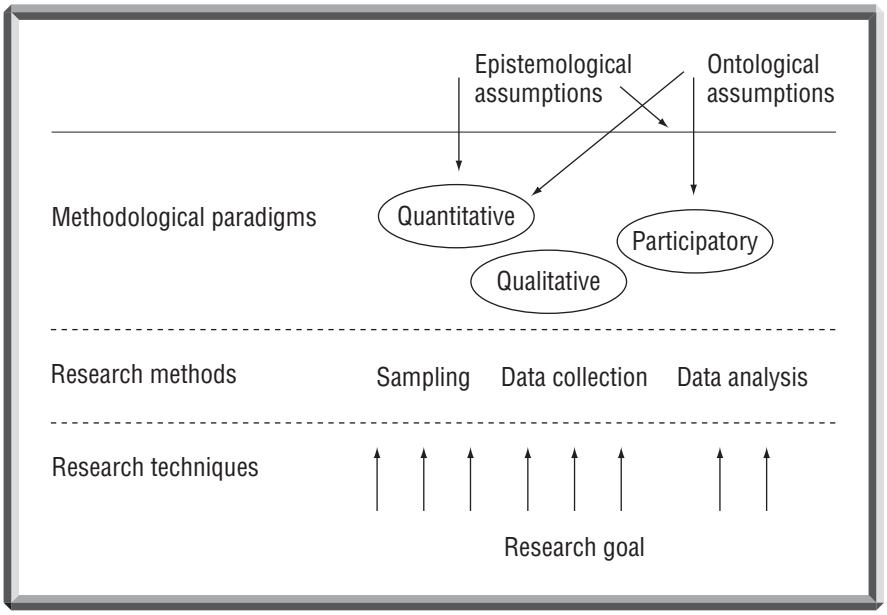
The distinction between 'techniques' and 'methods' is hence one of degree and scope. 'Methods' include classes of techniques, skills and instruments.

## Methodological paradigms

At the highest level of complexity we find what I would refer to as methodological paradigms. These methodological paradigms, for instance quanti-

tative, qualitative and participatory action paradigms, are not merely collections of research methods and techniques, but also include certain assumptions and values regarding their use under specific circumstances. At this level we encounter both the actual methods and the techniques and the underlying philosophy regarding their use. The philosophy would include a 'theory' of when and why to apply, for example, quantitative rather than qualitative methods, an awareness of the limitations of various methods, and so on. The distinction between the three levels in the methodological dimension is represented in figure 7.1.

**Figure 7.1** Levels in the methodological dimension




## Some comments

1. It should not come as a surprise that different classification principles operate at each level of the methodological dimension. At the first two levels, namely the levels of concrete techniques and of more generic methods, we tend to classify the available means according to the task at hand. This is another way of making the straightforward but often ignored point that there is no point in discussing 'techniques' and 'methods' in a vacuum. These terms should be defined in terms of a well-defined task or goal.

   Consider an example from everyday life. Someone who has heard that I need to repair my car would be unable to assess what tools I need to repair it with unless I specify what I need to repair: for instance a flat tyre or a broken fanbelt. Similarly, in scientific inquiry, a question about methods and techniques must specify the task at hand, for instance whether it is to draw a sample, collect data or draw inferences from data.

At the third level of complexity we tend to classify methodologies in terms of more general epistemological and ontological assumptions rather than in terms of specific tasks, because we are no longer operating at this level of concreteness. Differences in assumptions about the aims of science in general, and about the nature of the social world and human behaviour, tend to divide proponents of such methodological paradigms.

2. But what exactly is the relationship between these three levels and specifically between methodological paradigms on the one hand, and methods and techniques on the other? The question that usually arises is whether the main methodological paradigms are compatible with each other. The following points are relevant:

   - Because research methods and techniques are task specific and the task is defined by the research goal; different studies use different methods or techniques for the simple reason that they have different objectives. The overriding rule is clear: the technique must be appropriate for the task at hand. This applies to data-collection and data-analysis techniques, to sampling and to questionnaire design. This implies that the use of both qualitative and quantitative methods in the same study will depend on the nature of the project. There are many examples where researchers have successfully applied both methods.
   - At the level of methodological paradigms, it becomes more difficult to 'mix and match' different paradigms. This is because a methodological paradigm includes methods and techniques, and also certain assumptions regarding the nature of the social world. It is specifically with regard to the latter that more fundamental differences of opinion on various issues, for instance the nature of human behaviour and causality, make the integration of paradigms very difficult, if not impossible. This issue is discussed below as it is reflected in debates about quantitative and qualitative paradigms.

## Elaboration: quantitative versus qualitative methodologies

There is no doubt that the long-standing debate on the relative merits and compatibility of the quantitative and qualitative paradigms has often been complicated by a lack of clarification of the real issue. As suggested earlier, the first two levels of the methodological dimension, namely research techniques and methods, and the third level, namely the methodological paradigm, must be clearly delineated.

The least complicated level of debate has been whether a researcher can or should combine quantitative and qualitative research methods and techniques. At one level, this is obviously unproblematic. There are numerous examples where researchers combine techniques that are usually accepted as quantitative and qualitative: for instance the researcher who uses probability sampling techniques in conjunction with in-depth interviewing or

basic descriptive statistics in analysing qualitative data. For many researchers, this way of doing social research is not only possible, but in fact desirable. They would argue that the use of multiple methods and techniques is actually one of the best ways to improve the quality of research.

Critics of such an interpretation of the relationship between the quantitative and qualitative usually base their criticism on two assumptions: firstly that the three levels of methodological dimension already discussed cannot be separated, and secondly that the epistemological and ontological assumptions present at the third level are so fundamental that adherents to different methodological paradigms cannot communicate with each other. If the second assumption is taken to its logical conclusion, one has to accept the 'incommensurability' of methodological paradigms.

However, both of these assumptions are problematic. As to the first assumption, it is not self-evident that the use of techniques and methods is determined by epistemological and ontological assumptions in any strong sense. The decision to use a certain technique, for instance questionnaires, is primarily defined by the research purpose, such as a sample survey of attitudes towards AIDS. A decision on techniques presupposes a decision about the unit of analysis (cf. the discussion of the ontological dimension in chapter 9). Similarly, the notion of what constitutes good information or valid results (the epistemological dimension) influences our decision to formulate a research problem in a particular way. Neither of these observations denies the fact that there are limitations to the use of any technique that is directly related to the nature of the phenomena being investigated. It is just not feasible to do a sample survey of 2000 individuals and to use in-depth or even focus-group interviewing techniques. The nature of the unit of analysis dictates one particular choice of technique and rules out another. But the real question is whether this means that the researcher is hereby also forced to accept a whole host of assumptions about the nature of human beings or society. This does not follow.

With regard to the second assumption about the incompatibility of epistemological and ontological assumptions, it is true that certain beliefs about the social world are radically incompatible. For instance, it would be logically inconsistent to believe that the only worthwhile 'objects' of research are quantifiable observable human behaviour and cognitive, mental entities. It is difficult to see how someone could simultaneously believe that human action is solely the outcome of rational individual choice and that all human behaviour is the result of external structural or societal forces impacting on human beings. But once again, we must guard against what I would call the 'philosopher's fallacy'. Well-developed, consistent social ontologies like these are only encountered in the World of Metascience. Social researchers are not usually interested in questions like these. In fact, one might even go so far as to suggest that, depending on the research problem, most social scientists can happily tolerate a range of seemingly conflicting assumptions about the social world. In my experience most social scientists are quite happy to leave these metascientific issues to the philosophers and get on with the job! This is not necessarily the right attitude in all cases, but it does explain why they are reconciled to using seemingly incompatible approaches for different studies.

In summary then: the so-called conflict between quantitative and qualitative paradigms (and one could also include the participatory research approach here) is not necessarily a 'real' conflict. At the methodical and technical level, most researchers accept that quantitative and qualitative tools are compatible and that the choice for their inclusion in a particular project is determined by the specific research problem. Critics of this 'compatibilist' position make two assumptions. The first is that, to a large degree, the use of research techniques is determined by certain epistemological and ontological assumptions, and the second is that there are fundamental and incommensurable differences in beliefs about the social world as illustrated by the differences in the approaches of behaviourists, constructivists and realists. Defenders of 'compatibilism', like myself, would argue that neither of these two assumptions is necessarily valid. In the final analysis, one has to examine each case before drawing any conclusions about the respective roles of epistemological and ontological assumptions at the methodical and technical level.

## Assignment

Consult any good journal in one of your main subjects. Select an article which is of a clearly qualitative nature. Study this article in depth and write a short essay on the main features of qualitative research as exemplified in it. As a second assignment, compare this study with any one of the four readings at the end of the book – all of which are predominantly quantitative. List some of the main differences between quantitative and qualitative research. For assistance in the second part of the assignment, you may wish to consult one of the following articles:

Mouton, J. 1983. Kwalitatiewe en kwantitatiewe metodologieë in die sosiale wetenskappe. *South African Journal of Sociology,* 14(2):124–131.

Mouton, J. 1985. Contemporary philosophies of science and the qualitative paradigm in the social sciences. *South African Journal of Sociology,* 16(3):81–89.

# 8

# *Research as a social activity (the sociological dimension)*

**Central theme**

Social research is a social practice. This means that social scientists belong to various organisations or groups and institutions that both constrain and enable their behaviour in important ways.

*Key concepts*

Research communities – disciplinary matrices – invisible colleges – relations of power – control mechanisms – codes of conduct.

## Main argument

In the final analysis, social research, like all other scientific inquiry, is a social practice. What does this mean? In essence it means that, like all the worlds of everyday life, the world of science is part of the social world. Although the world of research views the world of everyday life as an object of inquiry, it is part of the social world. This implies the following:

- Researchers are social beings with specific beliefs, values and interests.
- Researchers follow certain implicit and explicit rules.
- The activities of researchers are conducted within more or less organised and institutionalised frameworks, which impose certain constraints on what is acceptable.
- Researchers stand in different relations of power to each other. This implies that access to resources differs across the research community.

## Elaboration: research communities and mechanisms of control

Sociologists of science maintain that scientists usually operate within clearly defined 'scientific communities' (Hagstrom) or 'invisible colleges' (Diane Crane) and that they belong to identifiable disciplinary matrices (Thomas Kuhn) or are linked in research networks.

It is only relatively recently (since the mid-nineteenth century) that we

PART 1

have witnessed the large-scale institutionalisation of the empirical social sciences. It was only in the second half of the nineteenth century that departments of psychology and sociology were established in Germany and the USA. In the early twentieth century, scientific societies were established to cater exclusively for the social sciences. Various other developments contributed to the growth of the social sciences in the twentieth century. These included the interest in public opinion polling in the twenties and thirties, the use of social science research during World War II and the rise of quantitative social science methods like sampling and statistics, both of which were reinforced by developments in the area of computerisation in the sixties. All of these developments have led to the establishment of what may justifiably be called the 'social sciences industry'. This has resulted in a proliferation and a concommitant increase in competition for resources such as funds, computers and infrastructure in a continually expanding industry.

However, the social dimension of science should not be limited to its tangible or material elements. Although social science has become 'big business' and extensive research programmes and surveys can no longer be conducted without the availability of extensive material resources, there are also social resources involved in scientific research. These are the intangible and non-material resources that are part and parcel of scientific networks and institutions. Examples are support networks formed by scientific societies and institutions, the role played by social science organisations in lobbying on behalf of social scientists, the role of journals, scientific societies and computer networks in linking researchers who share common interests, and the role played by national data archives and scientific databases in information exchange.

Social rules and conventions regulate social life. This is equally true of science as a social system. It is impossible to list all the potential ways in which social rules such as norms, principles, regulations and laws affect social scientists in general. Because social scientists are citizens of countries, they are already subject to the laws and regulations of their countries, of which laws on freedom of information, copyright and libel are examples.

An example of South African legislation that impacts on survey research is the Electoral Act (20 of 1993:72).

*No person shall during the period commencing 21 days prior to the election period until the end of the election period publish in the electronic or printed media the results of any opinion poll purporting to reflect the level of support enjoyed by registered parties or candidates or the policies they advocate.*

*The above provision shall not prohibit the conduct of opinion polls by registered parties for the purpose of their election for votes on behalf of such registered parties or candidates or the publishing in the electronic or printed media or the results so obtained after the election period.*

However, there are two categories of social rules that impact directly on the manner in which social research is conducted, namely the rules that pertain to the allocation of social resources within the scientific community and the rules that pertain to the relationship between researchers and participants in research projects. This issue is usually dealt with in discussions on research ethics. The domain of research ethics is concerned with protection of the rights and interests of research participants. Rules of research conduct regulate the behaviour of social scientists and ensure protection of the rights of participants in research projects. These rights include the right to privacy, informed consent and confidentiality.

But social rules also regulate the behaviour of members of the scientific community in their interaction with each other. Depending on the nature of the activities and the resources, various kinds of rules will apply. In *The scientific community,* Hagstrom (1965) depicts a research community as one that is characterised by the exchange of information for the sake of community-specific rewards. A researcher who produces acceptable scientific information is rewarded by having his findings accepted for publication, by being elected to the editorial boards of learned journals, and so on. Störer (*The social system of science,* 1966) advocates a similar model, except that he interprets 'scientific information' as 'creative products' which are exchanged for academic recognition. A characteristic of both of these models is the degree of social control with which scientific communities are credited. Because scientists seek recognition they tend to accept not only the goals but also the rules, sometimes tacit, of the research community. This system of social control is institutionalised in many forms:

- Review systems for either research grants or articles in scientific journals incorporate rules such as blind refereeing and peer evaluation.
- Rules of promotion within research organisations would include reference to the academic track records of candidates, their teaching records and community work.
- Rules of membership of various kinds of scientific organisations and societies include reference to degrees, publications and other achievements.
- Rules of dissemination require that due recognition be given to the works of cited authors (rule of plagiarism) when quoting authors and that dissemination must be effected through public means and should not be limited to select groups.

These are all examples of ways in which the interrelationships within the scientific community are organised and controlled at both local and global levels. Underlying these rules are values such as excellence, quality, fairness, openness, equity and justice. It should be emphasised that the application of these rules carries with it a sanction which is no less severe than in other social systems. Professional societies have codes of conduct and scientific institutions have disciplinary codes in accordance with which any transgression of rules is punished. Consequently, those who are in positions of authority (research institution boards, heads of departments, funding agencies and editorial boards) wield immense control and power within a specific community. When power is abused through plagiarism, favouritism, nepotism and elitism, inequity and injustice will be manifested in the science system. There are enough examples of scientific fraud and favouritism to dispel any notion of the value-free and clinically objective scientist!

## Critical reflection and assignment

A policy embodies a range of 'rules' or 'normative principles' that regulate the conduct of a certain group of people. In our daily life we regularly

PART 1

encounter various policies such as policies for affirmative action, education and development. Read the following four examples of statements of editorial policy. The first two are from overseas journals and the other two are from South African journals. Write a short essay on the implicit and explicit rules and values embodied in these statements.

## Editorial policy statements

### DEVIANT BEHAVIOUR: AN INTERDISCIPLINARY JOURNAL

*Deviant Behaviour* provides a forum for recording and disseminating the latest and most insightful scientific investigations of cultural norm violation and attendant social disvaluement … The vagaries of social deviancy are explored with the widest possible latitude for theoretical perspective and methodological persuasion, and the concerns of description, etiology, analysis, prevention or control may be invoked. Papers dealing with traditional areas of deviant behavior are encouraged, as are papers addressing more narrowly defined examples of deviancy. Conventional and controversial viewpoints are equally welcome.

Submission of a manuscript to this journal is understood to imply that it or substantial parts of it have not been published or accepted for publication elsewhere and that it is not under consideration for publication elsewhere.

### HUMAN RELATIONS: TOWARDS THE INTEGRATION OF THE SOCIAL SCIENCES

The Tavistock Institute founded *Human Relations* in the belief that social scientists should work toward integrating their disciplines in the attempt to understand the complexities of human problems, and that both researchers and practitioners should translate understanding into action by making links between theory and practice. Such linkages increase the likelihood of relevance and of innovative research in emerging fields of work, taking the social scientist outside traditional areas and approaches. We emphasize our openness to such thinking and experimentation.

We wish to attract manuscripts from a wide range of contributors who are working within their own discipline in a way which is yet transcendent of it or which deliberately crosses disciplinary boundaries. Further, as an international journal, we invite manuscripts from all countries. Our intent is to reflect a broad spectrum of problems and approaches toward an integration of the social sciences.

Authors may discuss theoretical developments, present new methods, or review articles, as well as report empirical research. Both qualitative and quantitative data are welcome. As an interdisciplinary journal, we accept that there can be no single convention in research design, method, and presentation.

### PERSPECTIVES IN EDUCATION

The policy of the editors of *Perspectives in Education* is to promote rigorous critical discussion and debate about education (in the broadest sense of the word), particularly in the context of Southern Africa, through the publication of academic articles based on original theoretical and empirical research and analysis. *Perspectives in Education* attempts to reflect the variety of perspectives current in the field, and publishes both discipline-based and inter-disciplinary research. In order to ensure all articles are of the highest quality, all contributions are submitted to at least two referees before acceptance for publication and decision to publish is based on their recommendations.

The editors affirm their unequivocal rejection of all discriminatory principles and practices in education, and in particular their rejection of the racist and discriminatory single non-racial education system to be established by the democratic participation of all South Africa's people which will provide for the development of their full potential.

## PSYCHOLOGY IN SOCIETY

*Psychology in Society* (PINS) is a journal which aims to critically explore and present ideas on the nature of psychology in apartheid and capitalist society. There is a special emphasis on the theory and practice of psychology in the South African context.

The editorial collective welcomes contributions which will develop debate on psychology and psychological issues in South Africa. In addition to articles and book reviews, short discussions on previously published material or on issues of the moment will be encouraged. Authors are required to use non-sexist and non-racist conventions in their contributions. Articles should not normally exceed 6000 words in length. And book reviews, unless they are review articles, should not exceed 1500 words.

# 9

# *The social world as an object of inquiry (the ontological dimension)*

**Central idea**

Social research aims to generate knowledge about the social world. In the final instance, all research is aimed at improved understanding by describing, explaining and evaluating phenomena in the social world. There are various interpretations of the 'nature of the social world' that affect the manner in which it is studied.

*Key concepts*

Social ontologies – naturalism – positivism – anti-positivism – constructivism – realism – unit of analysis – organisations – institutions – actions – events – interventions – cultural objects.

## Main argument

The term 'ontology' literally means the study of 'being' or 'reality'. I will also use the term 'social ontologies' to refer to conceptions of the ontology of social reality. How we define 'social reality' is, of course, a contestable matter. The history of social science is also the history of different theories of the social world. Theories such as behaviourism and constructivism represent different 'pictures' or 'accounts' of the social world.

Behaviourism is the doctrine that psychology should restrict itself to the study and explanation of stimuli and responses and ignore mental events.

Constructivism is the doctrine that complex mental structures are neither innate nor passively derived from experience, but are actively constructed by the mind.

An even more fundamental question dominates many of the debates about the nature of the social world: namely, to what extent, if at all, are the natural and social worlds similar or comparable? It is not surprising that the seventeenth- and eighteenth-century scholars, Francis Bacon, Thomas Hobbes, David Hume and Adam Smith, who first reflected on the possibility of a social science, looked to their colleagues in the natural sciences and to their successes and posed the following question: Are there not enough similarities between the social world and the natural world that we could, at least in principle, fol-

low the methodological rules that have proved so successful in the natural sciences? This has indeed become the key issue according to which one can classify the main ontological approaches in the social sciences.

Those who agree that there are sufficient similarities between the social and natural worlds are known as 'ontological naturalists' or 'positivists'. They believe, usually on the basis of theories such as evolutionary theory or systems theory, that there are enough similarities in the behaviour of all beings to justify the pursuit of a similar epistemology and methodology in all the sciences.

Those who disagree with the naturalists or positivists can be broadly classified into two categories: the anti-positivists and the realists.

- The anti-positivists believe that the differences between the social world and the natural world are so fundamental that there can be no basis for using the same methods and techniques in the human sciences. Anti-positivists would include, *inter alia,* constructivists, interpretivists and phenomenologists.
- Realists, on the other hand, believe that, although there are fundamental differences between the social and natural world, there are also certain similarities, or at least continuities, which justify the adoption of similar approaches in epistemology and methodology.

However, one should avoid creating the impression that most social researchers have explicit social ontologies. This is clearly not the case. On the whole, social scientists hold very implicit beliefs about the social world and most of them would see no point in making such beliefs explicit. Well-articulated and systematic ontologies are really only encountered in the World of Metascience (World 3). The fact of the matter is that philosophers of science usually debate issues on the ontology of the social world. In their reflection on World 2 they make explicit what is only implicitly held by the scientists.

But the question that interests all social scientists is: what kinds of entities do we encounter in the social world? Even if they do differ about the 'nature' of these entities, most researchers will agree that there are certain basic categories or classes of social phenomena. In the discussion below, we identify seven categories of 'social entities', namely individuals, collectives, organisations, institutions, actions, interventions and cultural objects.

## Elaboration: a typology of the 'furniture' in the social world

The social world is 'populated' by various kinds of 'entities' and social 'objects'. The lines along which social science disciplines have developed, especially since the late nineteenth century, provide the first indication of the wide range of subject matter in the social sciences. Broad distinctions between social and human sciences, or between the behavioural and cultural sciences, suggest one way of demarcating the social world. Disciplinary differences between disciplines that primarily study texts such as literary theory, theology and history and the ones that study social action like soci-

ology and anthropology, suggest an alternative classification, namely one based respectively on hermeneutic and social sciences. However, it would be inappropriate to try and develop an 'encyclopaedia' of the human sciences at this stage. The purpose of the classification of 'social objects' provided below is to list the broad categories and not to compile a complete list. The idea is to show how different definitions of what is also referred to as 'the unit of analysis' influence other decisions in the research process. It also aims to show how a broad classification of units of analysis will help us to understand the differences in research designs in the social sciences. But I am pre-empting the story.

## Individuals

Individual human beings are probably the most common 'object' of research in the social sciences. Social scientists are of course interested in different 'categories' of individuals. Delimitation of these categories will vary with the research objectives of the study. These may include such 'categories' as adolescents, the aged, students, constituents, politicians, academics, factory workers or just the general public.

It is important to realise that such categories of individuals are not 'given'. It is not as though there are natural kinds of human beings. Most of these categories are constructed. This means that how one defines a particular set of individuals is very important. Are 'students' defined as those who are enrolled full-time at a university or college or would part-time students also be included? Does the definition of 'employed' include only individuals who are employed on a full-time basis or in the formal sector, or what other individuals are included? The difficulties involved in distinguishing between 'economically active' people as a group and 'economically inactive' individuals, the 'political elite' and the 'masses', and so forth, are further examples of the problem of defining categories.

A definition of the unit of analysis for a study is determined by what could be called the 'ontological complexity' of the category. Although gender distinctions do pose problems, they are still less problematic than racial distinctions. Age groups are usually more easily delineated than occupational classifications. When 'constructed units of analysis' or 'constructed cases', are being used, individual researchers will inevitably construct, define or interpret such distinctions differently.

## Collectives

Another typical 'object' of study in social inquiry is 'groupings' or 'collections' of people who are (or define themselves as) members of larger geographical, political or cultural entities (to name a few). We will refer to such units of analysis as 'collectives' and include under this heading entities such as nations, cities, towns, communities and tribes.

## Organisations (formal and informal)

An organisation is defined as any social unit that coordinates the activities of its members. It is common to distinguish between 'formal' and 'infor-

mal' organisations. In a formal organisation, rules and duties are officially prescribed and enforced. Corporations, banks, insurance companies, police departments and government bureaus are all examples of formal organisations. In an informal organisation, which is also referred to as a 'voluntary' organisation, members are expected to support the organisation, but rules are less formal and expectations more flexible. Examples are clubs, lodges, public service groups and groups serving special causes, such as Operation Hunger.

The reason for sometimes having to study organisations rather than individuals can be attributed to the fact that organisations have characteristics that do not necessarily apply to the behaviour of individuals. Bhaskar and others have referred to these characteristics as 'emergent' properties. Corporations for instance, have certain properties which could not be predicated of individuals. Such properties include phenomena like an ethos or corporate culture. Gangs, which are informal organisations, have a distinctive 'code of conduct'. For this reason it would simply be wrong to explain the 'behaviour' of organisations in terms of the characteristics and features of individual members.

## Institutions

Peter Berger (1963) defines institutions as 'regulatory patterns'. People generally identify 'institutions' with organisations that somehow 'contain' people: hospitals and universities are examples. According to Berger common usage associates the term too closely with social entities that are recognised and codified by law. For Berger, institutions have the following features: externality, objectivity, coerciveness, moral authority and historicity.

He hence includes more 'common' types of institutions in his list, namely economic institutions like factories, companies and trade unions, political institutions like parliaments, senates and congresses, and religious institutions such as churches and educational institutions like schools, colleges and universities. He also includes language, which has all the features of an institution. In terms of our discussion in chapter 2, it is clear that, in terms of Berger's interpretation of the word, 'science' can also be regarded as an institution.

Here, as in the case of 'organisations', the focus is once more on the unique emergent properties of these social entities. Among these properties are institutional structure, lines of authority, promotional policy, the representativeness of minority groups on the payroll, labour relations practices and productivity.

## Social actions and events

The 'object' of study is sometimes not an individual actor or group of actors performing certain actions and activities or holding certain beliefs, but the actions themselves. There is a fundamental ontological difference between human actions, which are dynamic and ongoing, and the outcomes of these actions. We will discuss the latter under the section on 'cultural objects'. With regard to actions, there are various ways of classifying

social activities. Christopher Lloyd (1988) distinguishes between the following categories:

1. *Face-to-face interaction* in small groups or social situations.
2. *Collective or group action* in which individuals participate in more or less conscious collaboration to achieve their goals and perhaps also the collective goals of the group.
3. *Patterned social action* in which individuals act in more or less unconscious collaboration with others to achieve individual goals. Traffic and speech patterns are examples of patterned social action.
4. *Political or structural action,* which is more or less consciously aimed at maintaining or transforming the patterns and structures of a culture and society.

All social action is geared toward either maintaining or transforming preexisting small- or large-scale structures. Examples of social actions or events would include marriage ceremonies, court hearings, traffic offences, divorces, race riots, acts of prostitution, and juvenile delinquency. Historical events would refer to 'mass actions' such as military battles, elections and revolutions.

### Cultural objects

In a general sense, the term 'cultural objects' is used to refer to all 'products' or outcomes of human behaviour. One would include here all the 'sediments' of human endeavour, that is, the achievements or outcomes of deliberate human decision making, for example, cultural and symbolic objects such as literary texts, paintings, sculptures and books.

### Interventions

A special class of human actions consists of the continuous or sustained interventions in the social world such as *programmes,* for instance in education, health care and management training; *policies,* which include affirmative action and performance appraisal; and *systems* such as information systems. Such interventions constitute a different category or unit of analysis because they are more *structured* and *patterned,* but less permanent and *stable* than *institutions* and organisations.

This concludes our discussion of typical units of analysis in the social sciences. It should be obvious that more refined classifications of each of these categories will occur in the various disciplines. Such refinements usually take place within a particular theoretical paradigm, for example, two researchers who respectively adhere to a systems and a Marxist approach, might both study individuals and their actions, but would describe and interpret such actions differently. However, this chapter was not intended as an attempt to analyse different theoretical approaches to the definition of the social world, but rather to present, in general terms, the main 'kinds' of units of analysis that social scientists typically encounter in their work.

## Critical reflection and assignment

Think of some typical 'objects' in the social world such as human beings, institutions and social events and in the natural world such as animals, plants and atoms and then list the similarities and differences between the two groups. How, in your opinion, do these differences influence the way we study them? Can you think of specific issues in the area of measurement and data collection that might be affected by these differences?

# 10

# *An integrated model of social science*

**Central theme**

The world of science can be compared to a series of concentric circles. At the centre we find the concrete research projects that are conducted by individuals or groups of scientists. In ever-widening circles one then finds the disciplinary, institutional, national and global contexts of science.

*Key concepts*

Globalisation – global context – national context of science – invisible college – institutional and disciplinary contexts.

## Main argument

Recent developments in the world of science have led to the introduction of the concept of 'globalisation' of science. What does this term mean? In *The consequences of modernity,* Anthony Giddens defines globalisation as:

> *the intensification of worldwide social relations which link distant localities in such a way that local happenings are shaped by events occurring many miles away and vice versa* (1990:64).

In other words, the phenomenon of globalisation means that, in various ways, most local events are embedded in larger networks of social relations and that they cannot escape being influenced by this broader context. Conversely, events at the local level are increasingly affecting global trends. Events in Bosnia, KwaZulu Natal and Jerusalem are examples in point.

This is especially true in the case of science. Advances in information and telecommunications technology are playing a decisive role in the increasing globalisation of knowledge. Some examples are:

- The extent to which scientific networks are now represented worldwide. International organisations such as UNESCO, the World Bank, the World Health Organisation and various agencies are now promoting research on a global rather than national scale.

- The establishment of cross-national universities such as the Central European University with campuses in Italy, the Czech Republic and Hungary. Distance education universities, such as the Open University (UK) and UNISA, are increasingly illustrating the irrelevance of national boundaries.
- International electronic networks like the Internet are instrumental in promoting immediate scientific communication and dissemination of research findings.
- The tendency toward globalisation is also reflected in the decrease in the importance of disciplinary boundaries.

But the global context of science constitutes only one pole on the continuum. The global context accommodates the big institutions, agencies and international research programmes such as HDP, MOST and CIESIN; cross-national surveys such as the World Values Survey, which was conducted in fifty countries in 1995; and international federations such as ICSU. At the other end of the scale, we have the individual social scientist who is involved in his or her own research project or programme. Let us focus on the project-specific context.

In *The subjective side of science,* Ian Mitroff (1974) develops an interesting typology of scientists. He distinguishes between the experimentalist, who is analytical and exact, the more moderate and hence flexible thinker, and the speculative, creative theoretician. In a subsequent publication, Mitroff and Kilmann (1978) suggested a new classification: the analytical scientist, the conceptual theoretician, the particular humanist and the conceptual humanist. The importance of these classifications is not so much their validity but rather the fact that they serve as reminders that, in the final analysis, science is conducted by individual human beings with vastly different personalities, cognitive styles, preferences and interests.

An appreciation of the role of the individual in research is important because it often explains the differences in perceptions about knowledge and methodology. A preference for a quantitative rather than a qualitative methodology, or for experimental rather than field methods, can be ascribed to the specific training of the individual scientist and/or to the researcher's preferences. Some scientists are 'number crunchers' by nature, whereas others are more comfortable as speculative theoreticians.

**Table 10.1** Individual researchers and global science

| The individual researchers | The global community of scientists |
|---|---|
| Project specific | Sciences in general |
| Concrete | Abstract |
| Limited in time and space | Supra-temporal and spatial |
| Clear boundaries | Diffuse and 'fuzzy' |
| Limited scope | Large scope ('big business') |
| Visible | 'Invisible' |

Thus far our discussion has focussed on the two extreme contexts of science: to wit, global and individual. What are some of the most important 'indicators' of these two contexts?

This table reflects the two extreme poles of the continuum. A more comprehensive picture of the different contexts of science is presented in figure 10.1.

**Figure 10.1** The contexts of science


As the attention shifts from one context to another, different aspects become either more or less important. Concepts that are quite useful in one context are completely irrelevant in another. For instance, terms such as 'cohesion', 'reward criteria' and 'peer group evaluation' are useful within the context of national research communities, but not for individual researchers. In the same vein one could refer to the particular 'skills', 'knowledgeability' and 'critical attitude' of an individual scientist, but not to those of a scientific community.

We shall summarise the main features of the various contexts within which research is conducted:

- In the most specific framework, science is embodied in the concrete and skilful activities of individual scientists. In this context, research is best understood as a decision-making process (cf. chapter 11). The scientist's task is to make well-founded decisions in order to investigate a research problem in the most systematic, reliable and valid manner.
- At the next level, we have the disciplinary context, which is the context of research communities that are bound together by a specific ethos and disciplinary training. Aspects such as disciplinary traditions, paradigms and shared values, even 'rituals', now become relevant and important.
- However, scientific research is not conducted in a vacuum. By far the largest proportion of present-day research is conducted within well-

established and sometimes highly regularised institutional structures such as universities, technikons, market research companies, non-government organisations and government agencies. Typically, each of these institutions would have its own research culture or philosophy, research policy and common practices that influence the lines along which research is conducted within the institution. Consider, for example, the differences between the university context with its tradition of academic freedom and basic research on the one hand, and the context of market research with its emphasis on utility and profitability on the other.

- At the most general levels of abstraction, there are national and international contexts of research where science involves researchers in a specific country or increasingly on a worldwide basis. In the national context, factors such as the national science and technology policy, national socio-economic priorities such as the RDP and the country's geopolitical location play an important role in defining the specific nature and focus of science in a particular country. At the transnational level, we have already referred to the impact of the globalisation of knowledge.

Although the main focus of this book is on the individual researcher and the specific context of a research project or programme, it is important to retain an awareness of the various contexts in which science is practised. We have argued that these contexts do impact on the specific context of individual research.

**Figure 10.2** The contexts in which scientific research is conducted

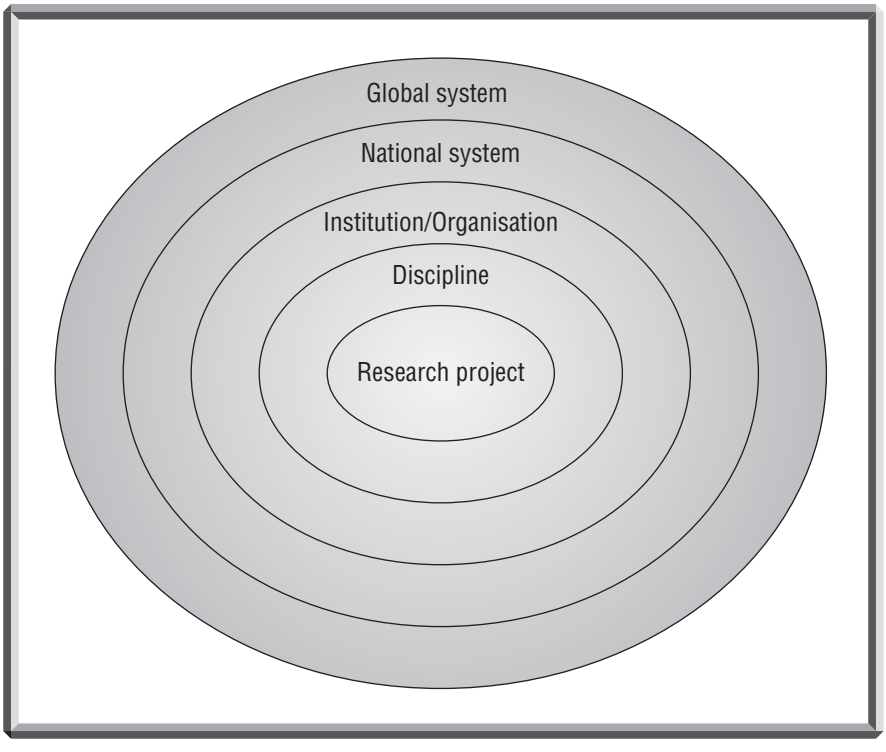


**Figure 10.3** The scientific enterprise

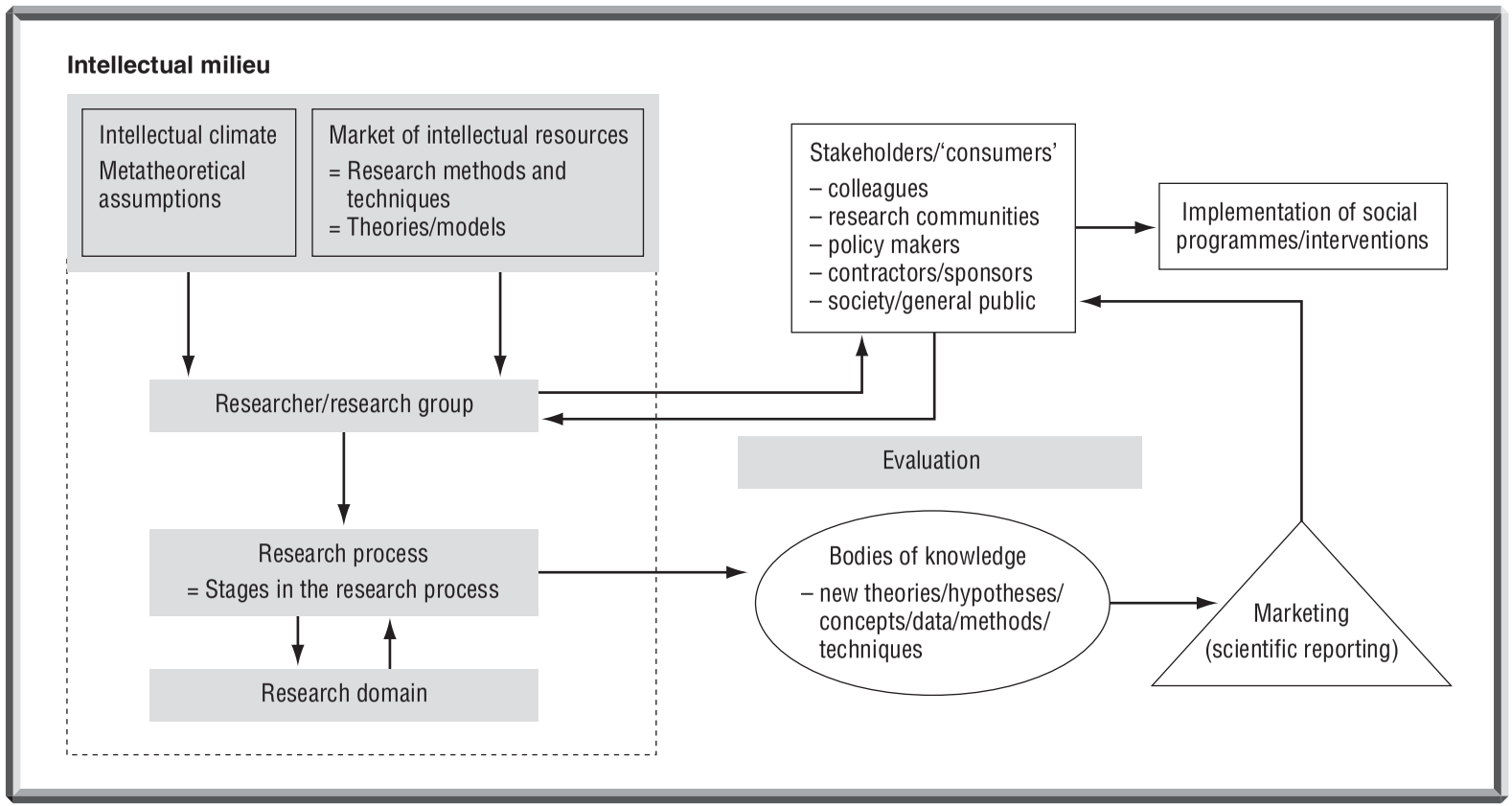


Figure 10.3 is a graphic summary of the discussions on the multi-contextuality of science and the different dimensions of research.

## Exposition of the diagram

The left side of the diagram focusses on the research process within the project and programme contexts. Researchers always operate in a particular intellectual milieu, which would include both the disciplinary and the institutional contexts.

The *intellectual climate* refers to the metatheoretical assumptions that are accepted as being valid within a discipline at a particular juncture. In the human sciences these would typically include assumptions about human beings, namely different anthropologcal approaches such as humanism, behaviourism and systems theory, and also the more discipline-specific assumptions and presuppositions on the nature of society, development, economy, history and so forth. The distinctive feature of these assumptions is that in science, they operate as postulates or presuppositions. This means that they are not part of the testable propositions and hypotheses of research. They actually precede such propositions.

The *market of intellectual resources* is the 'stock' of resources that is directly related to the epistemic status of science (World 2). There are two main categories, namely theoretical resources and methodological resources. Theoretical resources include all the theories, models, interpretations and research findings about the social world, that are accepted by the scientific community as valid or plausible. Methodological resources include all the methods, techniques and approaches that are utilised in the research process.

The right side of the diagram reflects the 'public' domain of science where stakeholders and interest groups become relevant. The output of science is diverse. There are the more traditional forms of output such as new data or findings, explanations, models and theories. In addition, science produces new technology, interventions, programmes and other 'practice-oriented' products.

Immediately these forms of output are produced and disseminated, they become part of the 'public domain'. Research findings are disseminated in various forms including publications, presentations and increasingly, various electronic forms. Depending on the nature of the research and the format of the output, specific stakeholders have an interest in the findings. These stakeholders would include other scientists, potential clients, donors, the general public and government. This also implies that different forms of scrutiny and evaluation take place in the public domain. The more standard practices of evaluation within the scientific community, such as peer evaluation and blind refereeing, are augmented by other forms of evaluation. Donors of science lay down specific guidelines of financial accountability. Where science leads to new interventions and technologies that might impact on the social world, scientists also have to be accountable to the general public, especially in ethically sensitive areas such as environmental or drug research and animal experimentation.

The diagram also focusses on the more traditional relationship between research and the body of knowledge. In cases where research leads to new findings or theories and the scientific community accepts these as valid and reliable, they become part of the body of knowledge within a specific discipline and hence of the future market of intellectual resources.

## Critical reflection and assignment

Read David Krathwohl's reconstruction of the progress of a research project. Then write a short essay on the different features of the scientific enterprise discussed in part 1 as they are reflected in this account.

How did this finding become knowledge? Many steps can be traced in the publication records; others we must fill in.

1. First there are three researchers, Jacob Kounin and his assistants, Wallace Friesen and Evangeline Norton. Each of them had to assess whether or not interpretation of the evidence showed consistent differences between classes of children who were emotionally disturbed to a comparable degree. Where momentum was maintained and transition was made smoothly, there was less behavioural deviancy. Their personal assessments are referred to as *knowing judgements.* Such judgements will be made by individuals thoughout the remainder of the journey: judgements on whether they accept the interpretation of the evidence as appropriate.
2. It took a *consensus* of knowing judgements among Kounin, Friesen and Norton for them to agree on the nature of their research report. Knowing is a personal judgement; acceptance of a finding as knowledge is subject to consensus of such judgements. Furthermore, there must be consensus at each judgement point on the path from initial investigator to research consumer. These findings were beginning the journey down the road to becoming knowledge.
3. Depending on the researcher's situation, different things happen at the next stage. If there are colleagues to hand who are working in either the same or a closely related field, most researchers will share the report with them. If there are no close colleagues at their own institution, some send copies to friends at other institutions. At either this stage or a later one, some send copies to the *'invisible college'* in their field, a designation adopted by Garvey, Lin, and Nelson (1970) during their study of communication in psychology. It describes an informal, usually unorganized, interinstitutional group of colleagues who have a common research interest. Their mutual admiration for what colleagues have achieved, their despair at the 'stupidity' of others and their hopes of being the first to make important contributions in an area promote a range of informal means of communication.

   Because the publication process is so slow, each invisible college member draws up a mailing list of colleagues who might be interested in his or her research or who may have been helpful in the past. He or she routinely sends preprints of research reports to this group, hence keeping them better informed on new developments. Individuals who are prominently cited in an article are also sent copies so that they can provide feedback to either confirm or modify notions about the proper interpretation of any set of data. The questions posed by invisible college members are likely to be among the most penetrating to be faced since, having worked in the same field, they can anticipate potential weaknesses. We assume that Kounin and his associates mailed copies of the report to interested colleagues.

4. Given positive responses, the authors probably decided to present their findings at an appropriate professional association meeting. They submitted an abstract of their report to the committee of the American Educational Research Association (AERA), charged with selecting papers on classroom research for the annual convention. The abstract was sent to each member of the committee, who independently judged whether to schedule a presentation of the report. The committee members pooled their judgements and agreed to schedule the paper. Again, there was a consensus of knowing judgements that the proposed interpretation of the data seemed appropriate and contained potentially significant findings.
5. If, as we presume, the study was presented at the next AERA convention, the presentation would have been followed by a discussion period in which findings and procedures could be questioned. Further questions would have been raised during informal discussions in the halls after the session. Again, these discussions would have taken place between colleagues knowledgeable in the field: polite but tough critics. Their questions cued the researchers to points in the report that were of concern to their audience. Since Kounin and his researchers believed that they could answer these questions satisfactorily, they maintained that their interpretation was appropriate and took steps in future reports to ensure that these questions were answered.
6. They submitted the paper, revised on the basis of the questions raised at the AERA convention, to the *Journal of Educational Psychology* for publication. The authors' names and any other identifying information were stripped from the manuscript by Ray Kuhlen, the editor (a good one). He sent it to one of the journal's consulting editors and to a couple of other researchers who were active in the field and whom he selected as competent and interested. These experts made knowing judgements that the findings held up under scrutiny, were appropriately interpreted, and constituted significant additions to the field. They recommended that the article be published, probably with some minor modifications to clarify procedure and interpretation. Note that because the reviewers were kept blind to the authors' names, the presentation had to stand on its own, unsupported by the reputation of the researchers or their institution.

   Kuhlen considered the readers' comments and his own reaction to the article very carefully. He had the authors make the few modifications needed and then scheduled it for publication. The consensus had continued to form.
7. In 1966 the paper was published under the title 'Managing emotionally disturbed children in regular classrooms' in volume 57 of the *Journal of Educational Psychology*. The editor considered the article sufficiently important to make it the opening article of the issue.
8. The first seven steps were also involved in a replication of the earlier study by Kounin and another assistant. Replication involves doing the study again; this time, they used fifty schools instead of thirty and videotaped full days' classroom activities rather than half days. The findings proved robust and were replicated; terminology and coding of activities were further clarified. The study was published in volume 2 of the *Journal of Special Education* as 'Managing emotionally disturbed children in regular classrooms: a replication and extension', by Jacob S. Kounin and Sylvia Obradovic (1968).
9. John Glavin and Herbert Quay were asked to write an article summarizing research on behaviour disorders for the February 1969 issue of the *Review of Educational Research*. They read the Kounin studies and decided that those findings and their interpretations were sound enough to be included in their review. Their article was accepted and published.

10. The findings were now in a secondary source, removed from the initial evidence and dependent for acceptance on the reader's trust of the reviewers' judgements. In addition, by 1970, a dozen other authors had cited these articles in papers. The fact that the original findings had held up under replication was an important factor in their acceptance. Their confirmation by an investigator other than the original researcher, however, would have provided even stronger confirmation. But there is in social science research neither the tradition nor the funding for replication that these appears to be in the natural science fields. Unfortunately, even Kounin's own replication of his earlier study is not all that common.
11. In 1970, Kounin published a book that summarized the research to date: *Discipline and group management in classrooms*. It began to take the place of the journal articles in citations by other researchers.
12. Robert Travis, a careful and meticulous worker, was charged with the responsibility of editing the second edition of the *Handbook of research on teaching* (1973). He asked Frank Hewett and Philip Blake (1973), fine researchers who knew the literature and were good judges of it, to write a chapter on teaching the emotionally disturbed. They included a section on classroom management and found the Glavin and Quay reference to Kounin's work. They believed it of sufficient importance to read the original studies. They included the first study in their chapter and for that matter, so did other chapter authors. In all, there were twenty references to this body of work. The new edition of the *Handbook* was published by Macmillan in 1973. The first edition had established it as an authoritative source; the second edition benefited from that reputation and rapidly became one, too.
13. Thomas Good and Jere Brophy (1990; originally published 1977), who were leaders in the teaching research field, decided to write an educational psychology text. It was destined to become one of the most popular texts in the field. They had been familiar with Kounin's work for a long while, since some of their own was based on it. They used the *Handbook* as a reference and the many citations to Kounin's work strengthened their own impressions of its soundness and importance. They included his findings in their text, which was published as *Educational psychology: a realistic approach.* Thousands of students were now exposed to the findings as knowledge.
14. Harold Mitzel was carefully chosen as editor for the massive task of preparing the fifth edition of the *Encyclopaedia of educational research.* On the advice of his board of editors, he asked Kevin Ryan to do an article on teacher characteristics. Ryan asked Debra Phillips to help, and they judged the Kounin work worthy of inclusion. The four-volume encyclopaedia was published by the Free Press in 1982.
15. From here on, other writers of texts, encyclopaedia articles, advice to teachers and parents, and articles to appear in *The Instructor and similar journals aimed at teachers, women's magazines and Reader's Digest* will all treat the findings as accepted knowledge. A consensus of knowing judgements extends all the way back to the first presentation of the study's results, which have now made the transition from findings to knowledge.

Krathwohl, D.R. 1993. *Methods of educational and social science research: an integrated approach.* London: Longman.

PART

# 2

# *The logic of the research process*

In part 2 we focus on the research process. The central idea of this section is that research is a *decision-making* process which has to follow certain logical principles.

The main steps in this decision-making process are described in chapter 11, whereas the basic logic – principles of reasoning – is discussed in chapter 12.

The remainder of part 2 elaborates on different forms of reasoning (chapter 13) with extensive reference to examples from the field of social science (chapter 14).

# 11

# *The process of social research*

**Central theme**

The process of social research involves continuous interaction between the researcher and the social world. During this interaction or engagement the researcher has to make a number of decisions in the pursuit of valid conclusions. The main stages in this decision-making process are problem formulation, conceptualisation, operationalisation, sampling, data collection, data analysis and interpretation.

**Keywords**

Decision-making process – engagement – judgment calls – problem formulation – conceptualisation – operationalisation – sampling – data collection – data analysis.

## Main argument

In part I we discussed two images of the nature of the research process in some detail: namely research as a journey or quest for truth, and research as a process of knowledge production. The first image emphasises the epistemological dimension of research, namely that the ultimate aim of all science is to arrive at results that are as valid or truthful as possible. The second image focusses our attention on the equally important issue of resources and resource management.

In this chapter we address a third image, namely research as a decision-making process. Our attention is now directed toward the researcher and the kind of decisions or judgment calls that he or she has to make during the research process.

Before discussing the kinds of decisions that have to be taken during research, we shall reflect briefly on the nature of the process itself. What exactly happens in the research process? We have already made the point that it is in the World of Science that phenomena in World 1 are made objects of systematic and methodical inquiry. It is for this reason that the relationship between the scientist and the world has traditionally been referred to as the 'subject-object' relationship. This was taken to mean that, as the 'knower', the scientist is the subject or agent, and the phenomena that she is studying are the 'objects' of her inquiry.

However, this has become a politically sensitive issue, especially for moral reasons. The criticism is that such a description of the relationship

between researchers and their human subjects opens up the possibility of reducing research subjects to mere instruments in the attainment of the larger research goal. It is argued that this results in the dehumanisation of the research subject and negation of the fact that the research subject is a free human agent with equal rights and freedoms to those of the researcher. Viewing this relationship in terms of *subject* and *object* disempowers those who participate in research projects.

More recently, a number of scholars, including Reason and Rowan (1981) and Morgan (1983) have suggested using the notion of 'engagement' to describe the relationship between the scientist and the 'object' of inquiry. The notion of 'engagement' suggests a kind of reciprocity and even mutual interdependence between the researcher and the research subject or participant.

Despite these criticisms, this way of describing the relationship does establish an important principle, namely that, for the sake of research, the scientist 'objectifies' some aspect of the social world. The scientist transforms a certain phenomenon into a cognitive 'object' of study by abstracting certain features from the social world.

Regardless of whether the relationship between the researcher and the social world is viewed primarily in terms of a 'subject-object' framework or in terms of an 'engagement' framework, the researcher still has to take certain decisions. He or she has to make judgment calls based on the information that is available.

What we refer to as the 'stages' in the research process or as the 'research cycle', are in fact 'clusters' of related decisions taken by the researcher. These stages (for example, defining key concepts or collecting data) are actually decisions to act in one specific way rather than in another. The following simple framework applies to all decision-making – also in research.

As rational agents we decide on a certain course of action against the background of the available information. A decision is deemed to be rational or reasonable when others, usually our peers, concur with our judgment. In other words, a decision is deemed to be a good one when there is consensus that, given the available information, it was the best decision. This implies that the most reasonable decision is the one that is judged to have the best chance of leading to whatever is defined as a successful outcome. We return to our analogy of the journey.

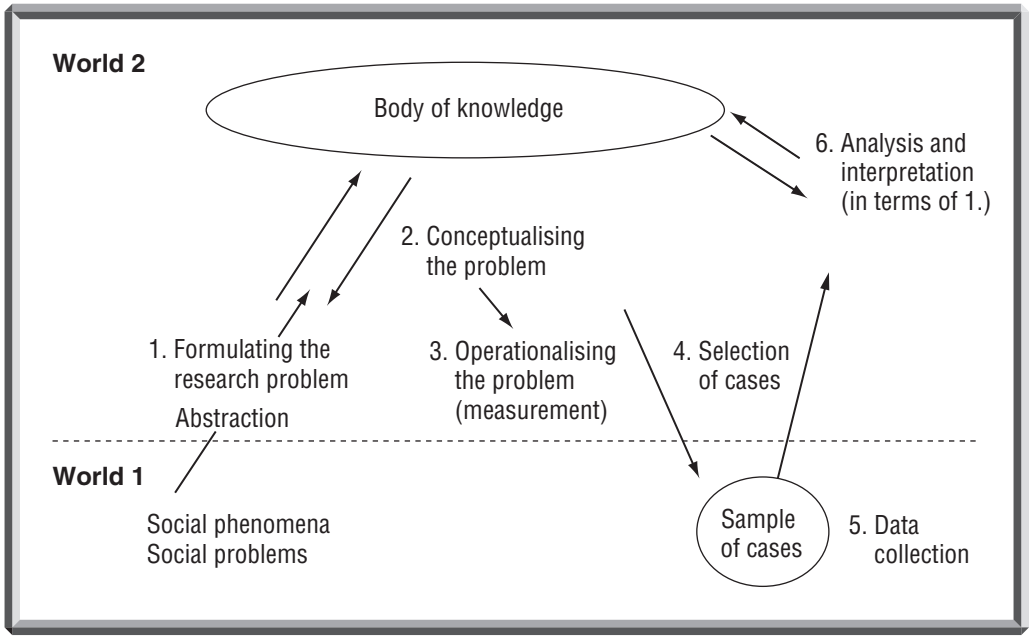
The traveller who wishes to ensure that he reaches his destination as planned in terms of the time frame and the budget, will take the appropriate decisions regarding the route, schedules, resources and mode of transportation. Such decisions are taken against the background of the available information. So, for instance, if the travel agent has informed the traveller that his plane leaves Johannesburg International at 19h00 on Thursday evening and he plans accordingly, one could say that he has acted rationally. If, in such a case, the traveller arrives at the airport and, owing to poor weather or a technical difficulty, the flight has been cancelled, no one would accuse him of having made a poor decision. Of course, if undertaking the journey is a matter of life and death, one would expect the person to have considered contingency plans. If, on the other hand, our traveller

simply arrives at the airport on the assumption that there will be a flight to his particular destination and that there are seats available, this would be seen as somewhat irrational behaviour.

This example shows that what is accepted as 'reasonable behaviour' or 'rational decision making', depends on a number of factors such as the goal or destination of the particular action, the information available and the risk associated with the outcome.

In the remainder of part 2, we will explore, in more detail, the notion of 'rational decision making' as it applies to research. But we must first identify the 'kinds' of decisions that a researcher has to make in a typical research project. The 'dynamics' of the process are illustrated in figure 11.1.

**Figure 11.1** The research process




## Formulating the research problem

All empirical scientific inquiry begins with a 'movement' from World 1 to World 2. Research commences at the point where someone, in this case the researcher, begins to reflect on some aspect of World 1. This reflection can be a very unstructured thought, a conjecture, a question or a hypothesis. Some phenomenon in the social world, like the nature of depth perception, the activities of drug addicts, the poverty of a large section of the population or the effectiveness of a new crime prevention programme, has prompted the researcher to ask a question that requires an answer. This 'phrasing of a question', this 'putting into words', involves a *cognitive* representation of some real world phenomena. Something concrete and socially real that has causes and effects, is cognitively or mentally *represented* in the

form of concepts that are strung together to form coherent propositions in the form of research questions. In simple terms, by formulating the problem, we are 'abstracting' from the 'concrete' social phenomenon.

## Conceptualising the problem

We distinguish between merely stating or formulating the problem and the next stage, which involves the conceptualisation of the problem. Conceptualisation involves at least two activities, namely the conceptual clarification or analysis of key concepts in the problem statement, and relating the problem to a broader conceptual framework or context.

Conceptual clarification involves definition of the key concepts, usually those referring to the key features of the phenomenon to be studied. If there are standard definitions in the field, these should be used. If not, the researcher has to ensure that the meanings of such concepts are clearly specified.

But conceptualisation also means integrating or embedding the research problem within a larger body of knowledge. Obviously this only applies where such a body of evidence does exist. The reason for doing systematic literature searches is to determine whether previous empirical research or theoretical studies, which may guide one's own study, have already been conducted.

## Operationalisation (constructing a measuring instrument)

Once the research problem has been conceptualised, we must specify *how* our conceptualisation, which is in the form of a hypothesis, theory or research problem, relates to the real world of things and events. We must establish linkages between our concepts and the phenomenon that we wish to investigate. This is done through the process of operationalisation or operational definitions.

There is a clear connection between conceptualisation and operationalisation, based on the distinction between the sense (connotation) and the reference (denotation) of concepts (cf. chapter 27). In the process of conceptualisation we analyse, *inter alia*, the meanings or connotations of concepts and their interrelationships. In the process of operationalisation, we define the references or denotations of these same concepts. The best way to operationalise is to list the measurement 'operations' or 'rules' in terms of which the classes of World 1 phenomena are uniquely determined. Operationalisation consists of the construction of 'a set of operations' or 'measures' (hence 'measurement') that link the research problem to the world. Such measures can be either highly structured, as in quantitative measurement procedures, or highly unstructured. But in *any* empirical social research, the formulation and conceptualisation of the research problem must be followed by a process of operationalisation.

It is important to note that the term 'measurement' is used in two senses in the literature. On the one hand, it refers to the construction of a measuring instrument such as a scale, a questionnaire, an interview schedule or an index. On the other hand, it involves the actual process of measuring some

phenomenon such as the incidence of juvenile crimes in a specific geographical area or attitudes regarding specific issues. In the latter case, measurement is actually synonymous with data collection. In this book the use of the term 'operationalisation' is limited to the actual design and development of a measuring instrument.

## Selection of cases

When formulating the problem, we already identify the 'kind' of social phenomenon that we plan to investigate. In chapter 9 we identified six kinds of 'units of analysis' in the social sciences. However, this simply meant that a certain *kind* of social entity, namely individuals, groups, organisations, social objects, social actions, interventions and social events, was identified. This process does not identify the actual 'population' of entities in the real world that meet the definition of 'the unit of analysis'. The selection of subjects or cases refers to (1) decisions regarding the population (of units of analysis) that we wish to study, and (2) decisions on whether, where practically possible, the whole population will be studied or whether we will, in fact, select samples of elements from the population.

## Data collection

Data collection involves applying the measuring instrument to the sample or cases selected for the investigation. We must constantly remind ourselves that the human senses (our eyes, ears, and occasionally even our taste and touch) are our 'first-order' measuring instruments, even if they are qualitative. On the basis of our visual, auditory and tactile observations and perceptions, we begin to classify responses, people, actions and events. However, because we aspire to truthful representations of the social world, we have to 'augment' our observations by more reliable and valid measuring instruments such as scales, questionnaires and observation schedules. If properly constructed and validated over time, such instruments assist us in collecting data that are more likely to be reliable than they would be had we not used instruments.

## DATA Analysis and interpretation

Data collection produces new information or data about the world that requires further 'processing'. Data processing involves at least two kinds of operations, namely data reduction, during which the quantitative and qualitative data are summarised, and data analysis. Data analysis would include both qualitative analysis, which includes processes such as thematical and content analysis, and quantitative or statistical analysis. Data processing is followed by synthesis, which involves 'interpretation' or 'explanation' of the data.

This concludes our discussion of the main stages in the research process. In the next section we argue that these are not merely consecutive steps in a chronological sequence of events, but that, underlying the process, there is a logic that is peculiar to scientific inquiry.

PART

2

## Critical reflection and assignment

Read reading 1 and identify each of the main stages in the research process, namely:

- statement of the problem;
- conceptualisation;
- operationalisation;
- selection of cases;
- analysis; and
- interpretation.

# 12

# *The logic of research*

**Central theme**

The logic of research is the logic of argumentation (or reasoning). This is well illustrated in the analogy between research and a court case. Just as an attorney builds and defends a case in court, a researcher builds and defends a specific point of view. This logic is expressed in what we refer to as the PEC-framework, which is the peculiar relationship between Problem, Evidence and Conclusion in research.

**Keywords**

Logic – argumentation – evidence – weight of evidence – premises – conclusions – inferences – inferential validity.

## Main argument

The logic of research is the logic of argumentation. Perhaps the best analogy is a legal one. What happens during for instance a murder trial? An attorney prosecutes someone (the defendant) by building a case on the evidence available. There may be different kinds of evidence such as eyewitness accounts, forensic evidence and ballistic evidence. The case is defended before a judge or jury, who have to make a judgement. Their judgement is the outcome of a process of weighing, as impartially and objectively as possible, the evidence presented.

The social scientist similarly argues for a specific point of view (an interpretation or explanation). She has also to adduce evidence in support of the particular point of view and 'defend' it before the 'jury' of peers – the research community. Many legal expressions, such as weight of evidence, burden of proof, arguing a case and beyond reasonable doubt, are just as applicable to scientific inquiry as they are to a court case!

Making judgements on the basis of the evidence available is part and parcel of being human. All our everyday decisions, for instance about what to wear (on the basis of the weather report) or which route to take to work (on the basis of traffic information), are judgements made on the basis of available evidence. Some judgements have further-reaching effects than others. Some examples are parents having to decide on a school for their child, a doctor who has to prescribe a specific course of antibiotics on the basis of a clinical diagnosis, or a politician deciding to implement a particu-

lar policy on the basis of the advice of policy analysts. But these are all examples of the general form of logical reasoning or argumentation. In all these cases, reasoning or argumentation consists of drawing certain conclusions or making certain judgements on the basis of some body of evidence. Scientific reasoning has a similar logical form: in a very basic sense, a scientific thesis or report is no more than an extended logical argument.

We shall define argument, following Larry Wright (1982:4), as 'the (usually) dispassionate marshalling of support for some statement (or viewpoint or conclusion or position)'. Just as, in everyday life, you might defend a certain point of view by citing evidence in its support, the social scientist attempts to muster scientific evidence in support of a specific point of view.

If scientific reasoning can be correctly characterised as being like a logical argument, then it follows that any research study has to comply with the rules of logic, the rules of valid reasoning. This suggests that we need to have clarity about concepts such as 'argument' and 'logical reasoning'.

## Elaboration: the nature of argumentation

The following is the basic scheme of a typical argument:

$S_1$
$S_2$
$S_3$
$S_4$
} Statements that are offered as support for or evidence of the conclusion reached – also known as the premises of the argument.

C Conclusion.

Consider an everyday example:

> There is no doubt that Italian drivers are the worst in the world. Just note how they ignore red traffic lights and stop signs. And it is hardly necessary to refer to their lack of courtesy when they cut across traffic lanes without indicating their intention of doing so and the way they force their way into lanes without considering other drivers!

This 'loose' argument can be represented schematically as follows:

$S_1$: Italian drivers ignore red traffic lights.
$S_2$: Italian drivers ignore stop signs.
$S_3$: Italian drivers force their way into traffic lanes.
$S_4$: Italian drivers change lanes without giving the necessary signals.
C: Italian drivers are the worst in Europe.

This particular example does not of course constitute a valid argument. Closer inspection reveals that the premises ($S_1$ to $S_4$) do not actually provide sufficient support for the conclusion (C). On the basis of $S_1$ to $S_4$ one would at best be able to claim that Italy has exceptionally poor drivers, but certainly not that they are the worst in Europe. Although they may well be the worst, this conclusion is not substantiated by the supporting evidence.

This is a typical example of 'inductive reasoning'. The distinctive feature of inductive reasoning is that, even if the supporting evidence or premises are accepted as true, there is always the possibility that the conclusion may *not* be true. The problem in such cases is usually that the conclusion is broader than the premises imply; the conclusion goes 'beyond' the data.

Our example illustrates another important feature of logical reasoning, namely that 'inferential validity' (drawing valid inferences) does not refer to the truth or reliability of the premises (for the sake of the argument it is accepted that they are true), but rather to the *relationship* between premises and conclusion. Drawing an inference refers to the 'logical jump' that one makes from the premises to the conclusions. The validity or acceptability of this 'jump' is determined, not by the validity of the premises, but by whether the premises provide support for the conclusions.

Empirical evidence that can provide support for the truth or likelihood of a conclusion must therefore be both 'true', or at least highly probable, and also relevant to the conclusion. But how does one assess 'relevance' of evidence?

Assume that we were to add the following premise to the preceding example:

$S_5$: Rome is the capital of Italy.

Although this statement happens to be true, it is clearly quite irrelevant to the conclusion. However, adding the following premise to the argument – '$S_6$: The accident rate in Italy is the highest in Europe' – would constitute more (relevant) supporting evidence. The reason why $S_5$ is not relevant to our argument while $S_6$ is, is obvious: the 'problem' that requires explanation or clarification, is the claim that 'Italian drivers are the worst in Europe'. $S_5$ does not address this claim in any way, whereas $S_6$ does. The notion of 'evidence' therefore *presupposes* a certain 'problem' or context. Relevance of evidence is determined by the problem or context.

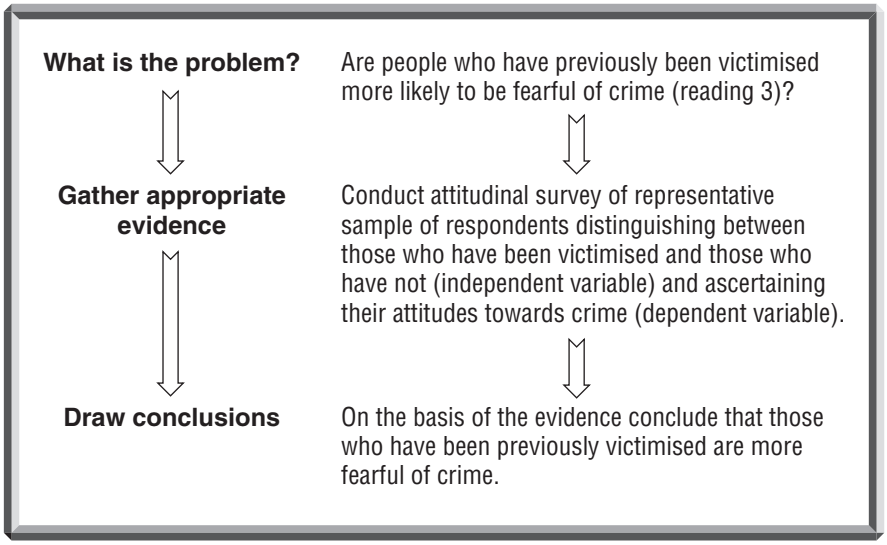
Thus: the statement in $S_6$ is relevant to the conclusion and also increases the likelihood that our conclusion (that Italian drivers are the worst in Europe) is true. Whether the addition of $S_6$ constitutes 'sufficient' evidence is a matter for debate. Some people would regard the addition of $S_6$ as adequate evidence, while others would want to investigate additional evidence such as the number of traffic violations per driver. The fact remains that $S_6$ is not only relevant but also *strengthens* the conclusion and thereby increases its inferential validity – the second condition of sufficient support.

To summarise then: there are *three key* 'elements' in any research project:

- The *problem* or research question or issue that is being addressed.
- The *evidence* required to address or solve the problem adequately.
- The *conclusions* that will be drawn on the basis of the evidence collected and will resolve the problem either way.

In the remainder of the book I shall refer to this as the PEC-framework of scientific reasoning. The PEC-framework constitutes – albeit in an oversimplified way – the general form of all reasoning in science. The logic that characterises all sound research is illustrated in figure 12.1.

**Figure 12.1** The logic used in research




## Some comments

There are obviously many variations of P, E and C. Even a cursory perusal of journals in the social sciences will reveal the considerable variety of research problems in this field. In basic research, such as testing hypotheses or theories, the research issues differ fundamentally from applied research problems such as evaluating the effectiveness of a new social programme or intervention. There is a substantial difference between empirical problems, for instance, what are the causes of absenteeism? and theoretical or conceptual problems: for instance, how should we define alienation? This is an important point to emphasise because the *kind* of research problem ultimately determines the *logic* of the study. What do we mean by this?

It means that the nature of the research problem (the kind of phenomenon to be studied, how much existing knowledge there is, and the purpose of the study) determines what will constitute *adequate* evidence. The kind of design and logic required for a study that aims to develop a new explanation or hypothesis for a specific phenomenon will differ from the kind required for a study which aims to confirm an already well-established theory. A study that is breaking new ground (exploratory) differs substantially from a study that aims to evaluate a social programme (programme evaluation research).

## Critical reflection and assignment

1. Write a one-page essay on the notion of *evidence*. You can approach it from any angle, for example by tracing the roots of the term, by referring to expressions in which the term is used, by distinguishing between different kinds of evidence, or in any other way.

Some clues:

Reconsider the analogy of a court case and terms such as *circumstantial evidence, inadmissible evidence, balancing evidence and the force of the evidence.*

2. Read readings 1, 2 and 4 and reconstruct the PEC-framework, as we have done with reading 3 above.

# 13

# *Inductive and deductive reasoning*

**The central theme**

There are two general forms of scientific reasoning: deductive and inductive reasoning, or more briefly, deduction and induction. We can further distinguish between two kinds of inductive reasoning, namely inductive generalisation and retroduction.

**Keywords**

Inductive reasoning – deductive reasoning – induction – deduction – inductive generalisation – retroduction.

## The main argument

We shall use an extended example to discuss the basic differences between deduction and induction. In the second half of the chapter we shall discuss the difference between inductive generalisation, which is sometimes simply referred to as 'generalisation', and retroduction, which is also referred to as 'diagnostic induction' or 'abduction'.

The following example taken from Larry Wright's excellent book entitled *Better reasoning* is a reconstruction of certain real events; and the reader must resist the temptation to allow any personal background knowledge – especially after *JFK the movie!* – to affect the reading of the example.

## The JFK example

Suppose we were considering various arguments in favour of the claim that President John F. Kennedy was in fact shot by Lee Harvey Oswald (this 'claim' would constitute the conclusion (C) of our argument). A first formulation of an argument in support of C, could be the following:

John F Kennedy (1916–1963) was the 35th president of the USA. Kennedy was assassinated while on a state visit to Dallas, Texas on 22 November 1963 by Lee Harvey Oswald who was in turn shot dead by Jack Ruby.

$S_1$: Shortly after the assassination, Lee Harvey Oswald was noticed in the book depository from which the shots had been fired.

C: Lee Harvey Oswald shot President Kennedy.

Although $S_1$ does lend some support to C, it is obvious that this does not constitute a strong argument in favour of the conclusion. So we immediately proceed to strengthen our argument by the addition of $S_2$:

$S_1$: Shortly after the assassination, Lee Harvey Oswald was noticed in the book depository from which the shots had been fired.

$S_2$: Oswald's palm print was found on a rifle left close to the window from which the shots had been fired.

C: Lee Harvey Oswald shot President Kennedy.

There can be little doubt that the addition of $S_2$ increases the likelihood of C being correct. However, if this evidence were to be presented before a jury, it is unlikely that it would convince the members. Let us assume, therefore – and remember that this is a creative reconstruction! – that we add two further pieces of evidence:

$S_1$: Shortly after the assassination, Lee Harvey Oswald was noticed in the book depository from which the shots had been fired.

$S_2$: Oswald's palm print was found on a rifle left close to the window from which the shots had been fired.

$S_3$: An eye witness identified Oswald as the assassin.

$S_4$: According to the ballistic tests, the fatal shots could have been fired from the rifle (in $S_2$).

C: Lee Harvey Oswald shot President Kennedy.

The support for C, offered by the arguments $S_1$ to $S_4$, now appears to be overwhelming. In most courts of law such evidence might even be judged sufficient. But let us continue and think of a somewhat more far-fetched possibility. Wright argues that the case against Oswald could have been made pretty much watertight had the following kind of evidence been available:

> *Assume that the owner of the book depository from which the shots were fired had been concerned about the security of his store. As a precautionary measure he had had closed-circuit television installed, and the whole episode had been recorded on tape. The quality of the recording was such that there could not be the slightest trace of doubt that it had indeed been Oswald who had fired the shots* (Wright, 1983).

What is clear is that each new piece of evidence increases the support for the conclusion. The addition of the final video-recorded evidence appears to have made the case watertight. On the basis of the evidence presented it is no longer possible to arrive at an alternative conclusion. One is virtually compelled to accept C! Or is one?

Perhaps there is a possibility, however remote, that Oswald was not the assassin! Assume, says Wright, that the evidence just referred to was fabricated. Assume that an amazingly ingenious plot was hatched to frame Oswald for the murder of President Kennedy. With this purpose in mind, an exact replica of the book depository was built elsewhere and equipped with similar video cameras; a similar motorcade was arranged, someone who bore an unusually close resemblance to Oswald did everything that the

real Oswald was supposed to have done, everything was recorded, the actual video tapes were replaced with the forged tapes, and so on.

Although this is perhaps not the type of evidence that anyone, and particularly not a jury, would regard seriously, it nonetheless remains a *logically* possible explanation of the existing evidence. In other words, the conclusion (C) does not *necessarily* follow logically from the evidence because this conclusion, although seemingly outrageous, is at least conceivable.

One could think up additional hypothetical examples, and even more outrageous ones (for example, mass hallucination or aliens), but in the final instance, there is only one way to remove all possible doubt if C is to follow *necessarily* from the premises. As Wright indicates, were that to happen, the nature of the argument would change radically.

Up to this point we have been concerned with the issue of the weight of the evidence: in logical terms this is an inductive argument. However, when we modify the argument so that the conclusion *necessarily* follows from the premises, the argument loses its *evidential* character. When this happens, the supporting evidence is linked to the conclusion on the basis of semantic considerations (the meaning of terms) rather than on any piece of empirical evidence. In such a case, either implicitly or explicitly, the conclusion is then already contained in the premises. This type of argument is called a deductive argument and would include a statement such as $S_5$.

$S_1$: Shortly after the assassination Lee Harvey Oswald was noticed in the book depository from which the shots had been fired.

$S_2$: Oswald's palm print was found on a rifle left close to the window from which the shots had been fired.

$S_3$: An eye witness identified Oswald as the assassin.

$S_4$: According to the ballistic tests, the fatal shots could have been fired from the rifle mentioned in $S_2$.

$S_5$: Mary Oswald's husband shot President Kennedy.

C: Lee Harvey Oswald shot President Kennedy.

The conclusion here is explicitly contained in the supporting premises. In fact, the inclusion of $S_5$ immediately makes $S_1$–$S_4$ redundant. This is what is meant by the above reference to the argument losing its 'evidentiary' nature. Of course, no-one would offer such an argument for any purpose other than to illustrate the difference between a deductive argument and an inductive argument.

This example was used to illustrate the principle of degrees of inductive support and the notion of adequate support. It simultaneously shows that inductive and deductive arguments differ radically. This difference will now be explored more systematically.

## Some definitions

It is important to reiterate that in our analysis of inferences – the inferential relationship between premises and conclusion – we are not questioning the epistemic status (the truth or falsity) of the premises. For the sake of argument we accept the truth of all the premises, in other words, that the evi-

dence is reliable. Having accepted the truth of the premises, we are interested in how much support they provide for the conclusion. In the Kennedy example, there were two possible answers to this question: inductive support, in which the premises provide gradual support (from a little to a lot) for the conclusion, and deductive validity (as a rule we will not use the expression deductive 'support'), in which the truth of the conclusion is either implicitly or explicitly contained in the premises.

This example enables us to define induction and deduction formally:

> *In an inductive argument, genuine supporting evidence (as expressed in the premises) can only lead to highly probable conclusions. In other words, in an inductive argument, supporting statements merely lend gradual support (from a little to a lot) to the conclusion(s).*
>
> *In a deductive argument, true premises necessarily lead to true conclusions; the truth of the conclusion is already either implicitly or explicitly contained in the truth of the premises.*

The following commonplace examples of deductive and inductive arguments illustrate the difference:

Deductive: All mammals have hearts.
All horses are mammals.
All horses have hearts.

Inductive: Horse 1 (was observed) to have a heart.
Horse 2 (was observed) to have a heart.
Horse 3 (was observed) to have a heart.
Horse n (was observed) to have a heart.
All horses have hearts.

The use of the same empirical evidence in both examples illustrates the important differences between inductive and deductive arguments. In both examples the truth of the premises is accepted. In the deductive argument, the conclusion is already (implicitly) contained in the premises, and the conclusion is no more than an explication of the premises. In the inductive argument, however, the conclusion is supported by the observations made (thus far) and is hence supported by the premises. The conclusion is highly probable, but, however unlikely this may appear, there is still a possibility that a type of horse that does not have a heart may be discovered. Thus, in the inductive argument the conclusion does not follow of necessity. The differences between induction and deduction are summarised as follows by Salmon (1973:14):

| *Deduction* | *Induction* |
|---|---|
| 1. If all the premises are true, then the conclusion must be true. | 1. If all the premises are true then the conclusion is probably, but not necessarily, true. |
| 2. All of the information or factual content in the conclusion was already contained, at least implicitly, in the premises. | 2. The conclusion contains information not even implicitly present in the premises. |

PART

2

## Inductive generalisation and retroductive inference

The two examples of non-deductive reasoning – the JFK example and the horse example – reveal an important difference between two kinds of inductive inference. In the first case, we drew a conclusion (that LHO shot JFK) on the basis of various items of supporting evidence. Both the premises and the conclusion refer to a single case, namely the assassination of JFK, and the conclusion is offered as the 'best explanation' of why something happened. In the second example, we drew a conclusion (that all horses have hearts) on the basis of a limited number of observations, but we generalised beyond the actual number of horses observed. In this particular case, the validity of our conclusion depends both on the accuracy of our observations (this applies in the first case as well) and on whether the cases that we have observed are *representative* of the total population of horses. It has become common to refer to these two kinds of inductive inference as examples of retroduction (or diagnostic induction) and inductive generalisation.

The common denominator in both examples is that our conclusions go beyond the premises in the sense that we add information that is not already contained in the premises. The difference between retroduction and inductive generalisation lies in the fact that our conclusions 'go beyond' the premises (the data). In the case of retroductive inference, our conclusion is an 'inference based on the best explanation' of the observed events. Our conclusion is offered as an *explanation* that provides an account of what has been observed (as expressed in the premises). So, in the JFK case, the conclusion (LHO shot JFK) is offered as the 'most plausible' explanation of the events (as expressed in premises $S_1$–$S_4$). In the second example, our conclusion goes beyond the data through the process of *generalisation*. The observed cases referred to by the premises refer are accepted as being sufficiently representative of a certain population of similar cases to enable us to formulate a generalisation that would apply to all such cases.

## Concluding remarks

These distinctions provide us with the following scheme of types of scientific reasoning:

1. Deduction: An inference where the conclusion follows necessarily from the premises, that is, the conclusion is already (explicitly or implicitly) contained in the premises.
2. Induction: Inference where the conclusions – in different ways – go *beyond* the premises.

2a. Inductive generalisation: An inference that generalises from the specific (the observed) to the general (but still observable).

2b. Retroduction: An inference from the observed to the (sometimes) hidden or underlying mechanism that explains the workings of what is observed.

## Critical reflection and assignment

One of the key points made in this chapter is that all three forms of scientific reasoning (deductive, inductive and retroductive) are usually found in the same study. This should not be surprising, since each form of reasoning serves a different purpose. The aim of deductive reasoning is to derive empirically testable hypotheses from existing theories. The aim of inductive generalisation is to broaden the scope and applicability of the findings of sample studies to larger populations of cases. The aim of retroductive reasoning is to put forward plausible explanations of empirical patterns and regularities in the data.

In Hill's study on the relationship between study time and grades (reading 2), he uses all three forms of scientific reasoning. Illustrate, by means of extensive reference to the article, how he does this.

# 14

# *Types of reasoning in social research*

**Central theme**

The three generic kinds of reasoning that are encountered in social research, namely deductive, retroductive and inductive generalisation, are discussed in detail. In each case the general form of the reasoning is made explicit and is clarified with reference to an empirical study.

**Keywords**

Deduction – hypothesis testing – logic of validation – induction – diagnostic induction – retroduction – inductive generalisation – statistical inference.

## Main argument

The three forms of scientific reasoning that were distinguished in the previous chapter, namely deduction, inductive generalisation and retroduction, perform three different functions in scientific inquiry. Let us summarise the function of each:

- *Deductive reasoning* is used when a researcher wishes to test an existing theory and has to generate research hypotheses. By definition, theories are usually fairly abstract and general statements that make empirical validation are quite difficult. But if a theory is true, or at least provides a plausible explanation of a certain phenomenon (for example, why religious people tend to be nice), it must be empirically testable. It must be possible to derive research hypotheses from such a theory in order to collect evidence which would either support or refute such hypotheses. Derivation of hypotheses from theories involves deductive reasoning.
- In survey research, field experiments and most other forms of quantitative research, it has become standard practice to draw samples of cases rather than attempting to gather data from the population. However, once the researcher has collected data from the sample, she usually wishes to generalise her findings to the target population. This 'movement' from sample to population involves *inductive generalisation.* In fact, some

researchers would argue that representative samples are not required if one wishes to generalise beyond the evidence collected. It has become acceptable, also in qualitative research, to use a form of inductive inference called analytic induction, to generalise from a small number of examined cases to a larger population of similar cases.

- Scientists are rarely satisfied with merely establishing that something is the case. It is not enough to know that there is some pattern, some regularity in human behaviour. We also want to know *why* people act in specific ways, why certain groups of people hold particular views, why some students perform better than others. We are interested in explanations of phenomena and events in the social word. Such explanations are put forward in the form of new hypotheses or theories. Such a hypothesis or theory is judged to be a good explanation if it provides a plausible account of certain observable phenomena; if it can show that it would be reasonable to expect certain patterns or regularities given that particular theory or hypothesis. But how do scientists come up with plausible explanations? It clearly involves a logical jump beyond the data. One needs to go beyond the evidence at hand and 'think up' an explanation. The kind of reasoning involved here is called *retroductive reasoning* or 'retroduction' for short.

In the remainder of the chapter, we will discuss an example of research in the social sciences (reading 1) that illustrates how these three forms of reasoning find expression in actual research. But before we discuss the example in detail, it is worth making an additional point. In chapter 12 we argued that the format of the research problem determines what would constitute appropriate evidence to address the problem. And precisely because reasoning is all about drawing conclusions from evidence, it follows that the form of reasoning is in fact determined by the nature of the research problem. In other words, the manner in which the problem is defined determines the kind of reasoning required in a particular study. Let us illustrate this by looking at the reasoning involved in two different kinds of study: hypothesis-testing studies and hypothesis-generating studies. The differences are presented schematically in figure 14.1 on page 82.

Although there are many variations in the statement of the problem and hence also in types of studies, this figure clearly illustrates the formal differences between the three kinds of reasoning.

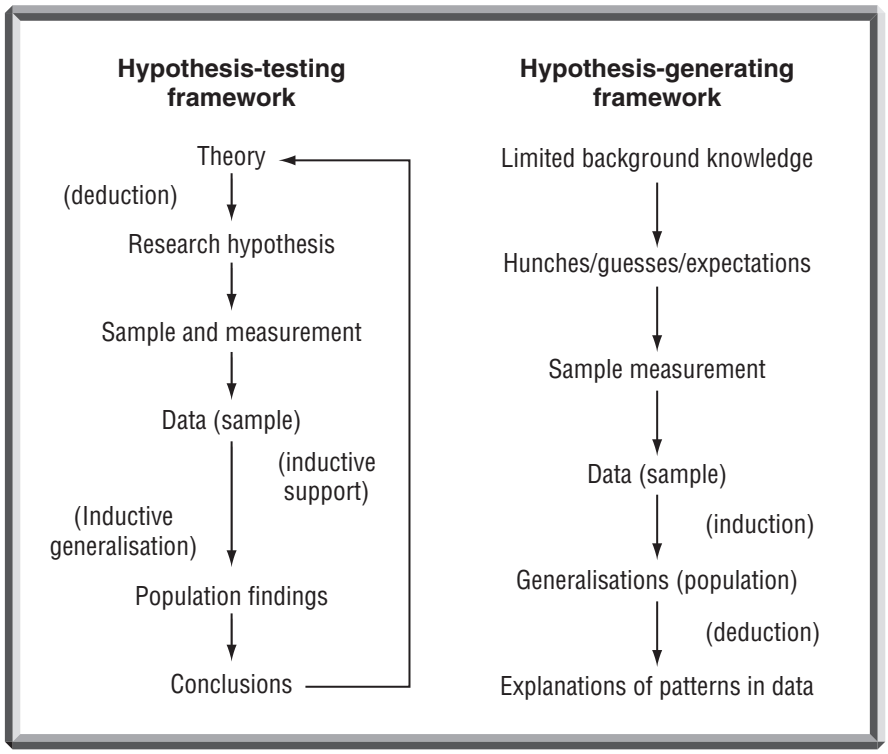
## Example: Giorgi's study on religious involvement in secularised societies (reading 1)

We begin by reconstructing the main decision-making stages in this study.

### Stage 1: The problem

Giorgi's general interest is in examining the 'secularisation profiles' of various European countries. As suggested by the title of the article, she is specifically interested in focussing on religious involvement in secularised

**Figure 14.1** The differences between hypothesis-testing studies and hypothesis-generating studies




societies. After discussing certain conceptual issues (the difference between 'the religious' and 'religion'), Giorgi remarks that the patterns usually associated with the process of secularisation are present in European countries. However, there are also certain cross-national variations that require explanation. Although she does not formulate this clearly, the research question of her study could be formulated as follows: If increasing secularisation can be expected over time in societies that are becoming increasingly industrialised and modernised, why are there still notable differences between countries?

## Stage 2: Conceptualisation of the problem

Giorgi then argues that Martin's general theory of secularisation, which is somewhat unique in that it examines secularisation in its politico-historical context, might in fact suggest an answer to this question. Let us quote Giorgi on what she regards as the core ideas of his theory:

> *While never made explicit, one basic assumption underlying Martin's theory is that both religion, especially through its institutional personification in a church, and the nation-state confer identify upon individuals, even if the identity conferred is of a qualitatively different kind. Consequently, even though national or group identity can be mediated through religion, in the*

*typical case, once the state becomes the identity nexus of a society, religion or rather the Church will be marginalized, and this affects individual religious involvement. But there are variations in the way this displacement is brought about, and hence different patterns can be seen to emerge … Within this context, and in true Weberian style, Martin's general theory set one basic premise: that historical events can and do become crucial in the way societies change and develop; they do so by delimiting the space along which change proceeds … the most crucial of these historical events for the secularisation process is of course the Reformation that fundamentally divided Europe across religious lines, thus challenging the tradition of the infallible Catholic unity and all that it represented.*

The main theses in Martin's theory can be summarised as follows:

1. Religion (through the church) and the nation-state confer identity on individuals.
2. Secularisation actually means that the state replaces the Church as the most important social entity or institution in a society.
3. Thus, once the nation-state becomes the identity nexus in a society, the role of religion becomes more marginal.
4. Secularisation patterns are not identical across societies.
5. Historical events are crucial in determining the way societies change.
6. The Reformation is the most crucial of historical events as far as the process of secularisation is concerned.

But what was distinctive about the Reformation? According to Martin, certain elements that had always been present in Christianity – which had always the potential for secularisation – were brought to the surface by Protestantism. One of the most important of these elements is the individualistic nature of Christianity. With the loss of ritual and symbolism that accompanied the Reformation, secularisation could no longer be held at bay!

This leads to the formulation of a final statement namely:

7. The Reformation (the rise of Protestantism) led to a re-emphasis of the rationalistic and individualistic elements that had always been present in Christianity.

If these seven statements, which form the core of Martin's theory, are true, what could be expected to follow from this? Martin in fact derives three more specific theses from this theory. We will confine ourselves to his first theses. This is Martin's argument as reconstructed by Giorgi:

*Martin associated Protestantism with individual striving, Catholicism with collective class antagonism … In those countries that adopted the Reformation, argues Martin, and hence Protestantism, the formal separation and effectively the subordination of the Church to the State was smoothly established. In Catholic countries, on the other hand, the Church was forced to oppose any rising political secular ideology, including the State that personified the secular in all its self-willed power … This establishes a spiral of secularisation in Catholic countries, which veers between the two*

*extremes of religiosity and atheism, where atheism is often associated with communism. In these countries, religion thus becomes a major issue in class conflict and political conflict in general. Alternatively, in Protestant countries, the Church is subordinate to the State from the start, and hence the cleavage between religion and politics is not as drastic as it is in Catholic countries.*

Giorgi has now reached the point where she can test a specific hypothesis, which is deductively derived from Martin's theory. The hypothesis (again not explicitly stated) can be formulated as follows:

> *(Given the different patterns in secularisation) … one would expect the patterns of religiosity (religious involvement) to differ in countries that are predominantly either Catholic or Protestant. More specifically, one would expect greater religious involvement in Catholic countries as opposed to Protestant countries.*

This still very general hypothesis is not immediately empirically testable. The key concept in the statement is that of 'religious involvement'. This raises the question of operationalisation.

### Stage 3: Operationalisation

In an earlier section of the paper, Giorgi has in fact argued that religious involvement can be operationalised through the use of four indicators, namely:

- church attendance;
- self-assessed religiosity;
- doctrinal orthodoxy; and
- devotionalism.

Each of these concepts is subsequently discussed in some detail and linked to specific items in the European Values Study conducted in ten European countries in 1981.

The other key question that follows from the above statement, is how one decides which countries are predominantly Catholic and which are predominantly Protestant. Table 1 in the article is presented to illustrate "the religious make-up" of the ten European countries. In fact, the table suggests the introduction of another category of 'mixed countries' where there are similar proportions of Catholic and Protestant believers (Ulster, Germany and Holland).

Having operationally defined the key concepts in the statement, Giorgi is now in a position to test the specific research hypothesis, which we can formulate as follows:

> *One would expect to find higher proportions of religiously involved people (as defined in terms of church attendance, self-assessed religiosity, etcetera) in the predominantly Catholic countries of Europe such as France, Italy and Spain than in the predominantly Protestant countries such as Britain*

*and Denmark. Less clear patterns might be expected to occur in the so-called 'mixed countries'.*

### Stage 4: Sample and data

Giorgi has very little to say on the sample and data. This is because she has used existing data collected as part of an international research programme in 1981. It is precisely because this is an extremely well-known study (European Values Study), which has been well documented elsewhere, that she probably assumed that her reader would be willing to accept the fact that the sampling and data collection are of a sufficiently high scientific quality.

### Stage 5: Analysis and interpretation

On the basis of the available data (more than 12 000 cases in ten countries) analysed through a simple two-way table (religious involvement by kind of country), she draws two conclusions:

> *Regarding the differences between Catholics and Protestants, as expected, Catholics not only attend church more regularly and profess to be religious in larger numbers than Protestants; they also endorse the religious doctrines to a greater extent than Protestants, and claim a higher degree of devotionalism. However, the non-conformists are probably as religious, if not more so, than Catholics themselves, despite being Protestant.*

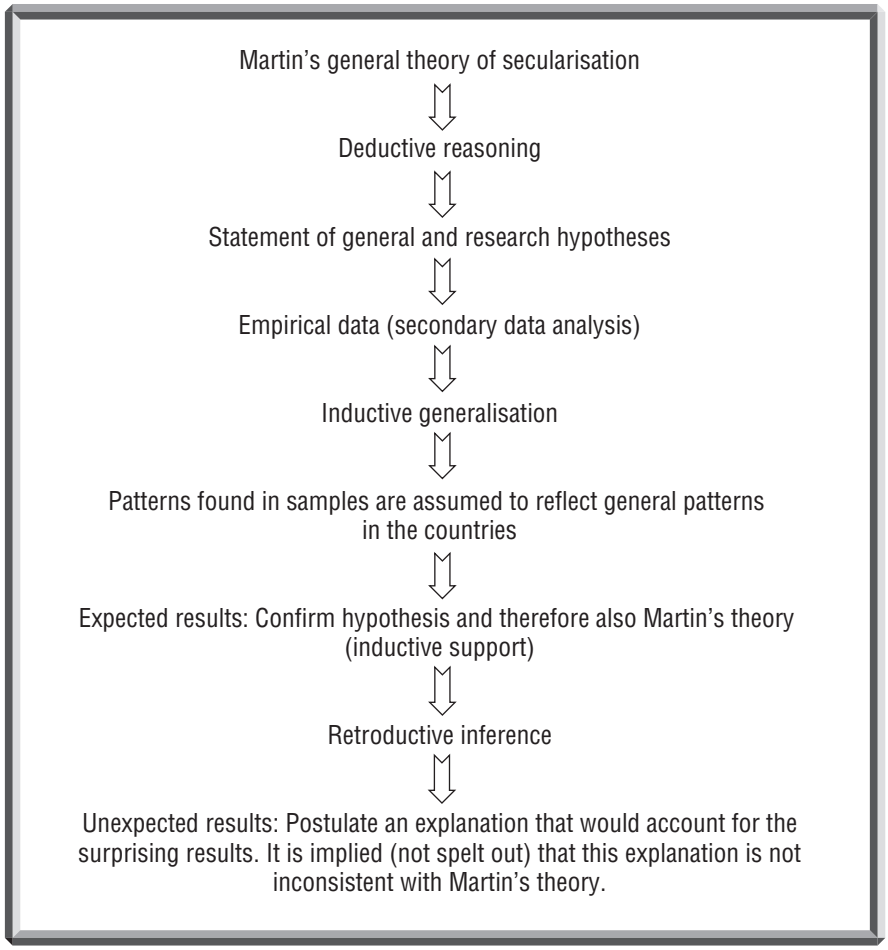
Since the first 'result' is as expected (that is, as it was 'predicted' by the hypothesis), no further comment is required. For the same reason, the rather unexpected second result (the high level of religiosity amongst those who do not belong to either Protestantism or Catholicism) does require an explanation. Giorgi takes up the challenge. She first rejects an explanation in terms of possible biased sampling ("The non-conformists comprise only a small number of the total sample, yet it is doubtful that their intense religiosity, as revealed in table 2, is an artefact of poor sampling"). The explanation that Giorgi puts forward: "Non-conformists are notorious for their militancy and conservatism in religious matters. If non-conformists comprise one extreme, the non-affiliators comprise the other. Among the latter, religious involvement is very low indeed".

This concludes our reconstruction of the Giorgi article. We will now show how, although they are not equally 'visible', all three kinds of reasoning are present in this study. The main stages in the reasoning process are presented below.

## Summary comments on the example

*Deductive reasoning* is exemplified in the derivation of the research hypothesis from Martin's general theory of secularisation. It has the typical form of a conditional: if Martin's theory is true, then the research hypothesis (as formulated) follows. Giorgi assumes the truth (or at least the plausibility!) of Martin's theory and proceeds to test the truth of the hypothesis derived.

**Figure 14.2** Stages in the reasoning process




*Inductive generalisation:* Where an inductive argument is followed there are two stages in this process. First, by inferring from the samples of the countries to the countries themselves, Giorgi generalises beyond the observed data. Although she does not defend this move, it is acceptable, given the status of the European Values Study. The second inductive inference takes place when Giorgi concludes, at the end of the paper, that the findings of her study "support Martin's general theory". This is a clear example of inductive support. Giorgi's study strengthens our belief in the truth of Martin's theory. It does not prove it conclusively (this is too much to expect anyway), but does substantiate it. This form of inductive reasoning is similar to the JFK example in chapter 13.

*Retroductive inference:* Faced with the surprising results about the high religiosity of non-conformists, Giorgi postulates an explanation. She has to 'invent' an explanation that will account for the observable patterns. Her hypothesis, which is the result of retroductive reasoning, not only accounts for the results as they pertain to non-conformists, but also explains why

non-affiliators scored very low on religious involvement. This gives her explanation an initial plausibility. But its real strength and true explanatory value will only be tested in future studies.

## Critical reflection and assignment

We have completed our reconstruction of Giorgi's article. She also investigated two other theses that she derived from Martin's general theory. As an assignment, summarise her arguments regarding these theses along the lines used in this chapter.

PART

# 3

# *Stages in the research process*

The aim of part 3 is twofold: firstly to provide a detailed discussion of the typical stages in the process of empirical research; and secondly to focus on issues of research design in social research.

With regard to the first objective, we emphasise that there are discernible stages in empirical research, starting with the formulation of the research problem and ending with the research report or thesis being written. Although these stages are presented as a sequence of steps in a process, the actual practice of research is far more 'messy'. Researchers typically work on more than one stage at a time, keep returning to previous stages and so on. In the final analysis, it is more important to adhere to the basic principles of the logic of research (the PEC-framework) that were discussed in part 2.

In terms of the second objective, our focus in each of the chapters is on issues of research design. This means a concern with the question: how does one maximise validity in empirical research or, stated differently, how does one control for possible sources of error. In this respect, the 'validity framework' presented in chapter 17 is the key to part 3.

# 15

# *Formulating the research problem (cases, variables and relationships)*

**Central theme**

Formulating the research problem consists of two key tasks: first, specifying the unit of analysis (the 'what' of the study) and second, clarifying the research objective or purpose (the 'why' of the study). Specifying the unit of analysis (the 'case') also involves clear identification of the kind of social 'entity' to be studied, the variables that one is interested in and the relationships between them.

**Key concepts**

Unit of analysis – case – variable – category – dependent and independent variables – quantitative and qualitative variables – the strength, direction and linearity of relationships.

## Main argument

The 'objects' or 'entities' that social scientists study, are usually referred to as the 'units of analysis' of a project. In chapter 9 we identified seven general categories of 'units of analysis': to wit, individuals, organisations, institutions, collectives, social objects, social actions or events, and interventions. It is usually not difficult to identify the unit of analysis of one's study. It is, very simply, *that* which one wishes to investigate. Another way of looking at it is that the unit of analysis is the 'entity' or 'phenomenon' to which one's conclusions ought to apply.

However, a common problem in research is that researchers tend to confuse the unit of analysis with the data source or sources. The following is an example. Many studies investigate aspects of individual human behaviour such as individual attitudes, beliefs or kinds of behaviour. In these cases the individual is the unit of analysis, whereas many possible data or information sources can be utilised. These might be interview data such as attitudinal surveys, direct observation such as laboratory experiments, and documentary sources such as diaries and letters (life histories). In the first two

examples the unit of analysis (the individual) and the data sources (individual interviews) are identical. In the third example, the unit of analysis (the individual) and the data sources (diaries, letters) are different.

This sometimes confuses novice researchers. There are many cases where the unit of analysis and the source of information regarding the unit of analysis differ. In studies of interventions like training programmes and policies, the intervention is the unit of analysis. In such a situation, individuals who have either designed or participated in the programmes, or both, might well be interviewed, in which case there will be more than one data source. A study of a social object such as a political text might similarly require interviews with certain individuals who are so-called experts, to gather information.

In summary then: it is important to distinguish clearly between the 'what' that you are investigating (the unit of analysis) and the data sources that have to be explored in gathering information or evidence about the unit of analysis. The best way to identify the unit of analysis is to 'think ahead' to the possible outcomes of your study and ask yourself: "To what entity or set of entities will my conclusions apply?" If you were to conclude, on the basis of your evidence, that eighty per cent of a certain group of individuals hold certain beliefs, then the individuals constitute your unit of analysis. If you were to conclude that a certain training programme had been effective in leading to higher productivity, the programme, which is a kind of intervention, is your unit of analysis. The 'object' or 'target' of your final conclusion is your unit of analysis.

'Cases' are defined as the actual concrete instances of the unit of analysis. Whereas the unit of analysis indicates a kind or type of entity, the 'cases' are the *actual* individuals or groups or towns studied. Thus, in an attitudinal survey of university students, the unit of analysis is 'the individual', while the cases are the actual students interviewed. Cases can be counted and might range from one (n=1 or single case designs) to thousands (for example in sample surveys).

Although the first step in most studies is to identify the unit of analysis, researchers are less interested in the actual 'entity' or 'object' than in aspects of and relationships among specific characteristics or features of such objects. We refer to characteristics or features that take on different values, categories, or attributes as *variables.* In the following section we focus on 'variables' and different ways of categorising them.

## Elaboration: variables and their attributes

Variables may vary over cases. For instance, individuals differ in terms of features such as age, gender and occupation. For an individual, any characteristic may vary over time – we grow older (age), more educated (level of education), hopefully richer (level of income), we may change party affiliation and so on.

It is clearly important to distinguish between variables and the attributes or categories of which they consist. Age is a variable that can range over a number of years (0–100), while political attitudes can have conservative, moderate or radical categories. Similarly, 'being divorced' or 'being female'

are not variables, but categories of the variables 'marital status' and 'gender' respectively. To distinguish clearly between a variable and its possible categories, you can apply the following rule of thumb. The terms that you use to describe someone, for example 'middle class', 'English speaking' and 'poor' are attributes of variables. The variables here are 'social status', 'language group' and 'level of income'. In order to help you understand the concepts 'case or unit of analysis', 'variables' and 'categories' better, some typical examples are given in table 15.1.

**Table 15.1** Research questions, units of analysis, and variables

| Research question/hypothesis [What one wants to know] | Unit of analysis [What entities are described and compared] | Variables [With respect to what characteristics] |
|---|---|---|
| Are older people politically more conservative than younger people? | Individuals | Age, political attitudes |
| The greater the increase in air passenger traffic at a city's airport, the greater the economic growth | Cities | Increase in air traffic, economic growth |
| The higher the proportion of female employees, the lower the wages in 19th-century factories | Factories | Proportion of female employees who earn average wages |
| Does economic development lower the birth rate? | Nations | Level of economic development, birth rate |
| A student's university performance is directly related to his/her parents' income and educational level | Individuals | University performance, parents' income and educational level |

Adapted from: Singleton, R.A. 1993. *Approaches to Social Research.* New York: Oxford University Press. p. 73.

## Elaboration: types of variables

Variables can be defined in various ways. In this section we shall look at the distinction between *independent and dependent* variables (which refers to the presumed causal relationship between variables).

### Independent and dependent variables

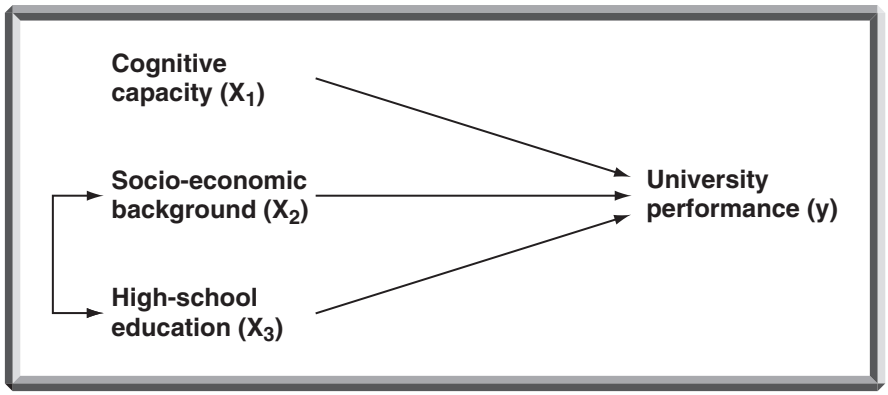
The distinction between the independent (or 'causal' or 'explanatory') variable and the dependent variable is an extremely useful distinction in social research. Although it was originally predominantly applied in experimental research, this distinction is now widely applied in most kinds of quantitative empirical research.

PART 3

An independent variable is the presumed cause of the dependent variable, which is the presumed effect. Independent variables are presumed to be the variables that are producing or causing certain effects as measured by the dependent variable or variables. Let us take an example. Say we are interested in explaining why some students perform better at university than others. The variable that we are interested in explaining is 'university performance'. Following on our discussion above, this variable will have different categories, such as excellent performance (above 75% in final exams), 'average performance', and 'poor performance' (not passing an examination).

We would hypothesise that many factors produce good university performance: the individual student's cognitive capacity, motivation, high-school education and preparation, and the socio-economic background of both student and parents. All of these presumed causal or explanatory factors are so-called independent variables. The independent variable is hence the antecedent, which means that it precedes the dependent variable, which is the consequent. This relationship can be stated in the form of a conditional conjunction: If A, then B: this is a conditional statement which says that if the independent variable A obtains, then the dependent variable B follows logically. We can illustrate this point schematically. Note that it is standard practice to use X to refer to the independent variable(s) and Y for the dependent variable. Note also that the arrow joining $X_2$ and $X_3$ indicates a relationship or correlation between these two variables.

**Figure 15.1** Causal relationships between variables




In experiments the independent variable is the variable that is manipulated by the experimenter. Say we are interested in studying the effects of two different teaching methods in a school. We are interested in determining whether the introduction of a new method of teaching second languages to primary school students will improve their pass rate. Teaching method (both the existing teaching method and the new one) is our independent variable, while the 'pass rate' (the variable that we wish to explain) is our dependent variable. We will typically manipulate the independent variable by dividing our sample of schools or classes into an experimental

group (where the new method is taught) and a control group (where the existing method is still taught). If we have ensured that the schools are relatively similar in terms of other important factors (average IQ of students, qualifications of teachers, socio-economic factors and so on) we would like to ascertain whether differences in scholastic performance between the experimental and control schools are to be attributed to the different teaching methods.

Studies aimed at showing that a specific intervention such as a teaching method, a new training programme or a new performance appraisal system leads to better results or is more effective than other comparable interventions, are not simple and require a lot of ingenuity and rigour on the part of the researcher.

## Quantitative and qualitative variables

Another important distinction is that between *quantitative* and *qualitative* variables. This distinction reflects a fundamental difference in the way that variable categories are represented numerically. A variable is quantitative if its values or categories consist of numbers and the differences between the categories can be expressed numerically. The variable 'age', which is measured in 'years', signifies a quantitative difference (a certain number of years) between people of different ages. Qualitative variables have discrete categories which are usually referred to by words or labels. The 'gender' variable has the discrete categories 'male' and 'female'; the variable 'political affiliation' has the discrete categories 'ANC', 'NP', 'IFP' and so on.

Having explained these distinctions, we can now discuss the different kinds of relationships between variables and how researchers describe these.

## Elaboration: relationships between variables

Researchers are typically, and perhaps ultimately, interested in the way that 'things' in the social world relate to each other. The aim of social research might even be defined as 'the search for enduring patterns or regularities in relationships among phenomena'. We are interested, for example, in determining whether there is a relationship between unemployment and crime, whether high levels of stress in the workplace are related to absenteeism and whether there is a link between religiosity and suicide attempts.

The term 'relationship' is part of our everyday vocabulary. We already know that certain events are related when for instance one event always seems to precede another. Examples are that certain hours in the mornings and afternoon are associated with heavy traffic volumes and that the advent of the Christmas season is related to increased consumer spending. All such relationships have two elements: first, two or more entities or events are involved and second, the combinations of events or situations usually change or vary simultaneously: in other words, the occurrence of the one, like the advent of Christmas, coincides with the occurrence of the other, namely increased spending. Two or more variables are therefore said to be related, associated or linked to the extent that changes in the one variable

are accompanied by systematic and sometimes predictable changes in the other. How variables vary (co-vary) depends on whether they are quantitative or qualitative.

## Relationships among qualitative variables

The core idea of a relationship or association between two qualitative variables is that if the one variable changes the other variable also does and that if one variable does not change, the other one does not change. Consider the relationship between race and executive position in an organisation. Affirmative action is one of the most pressing problems in South Africa at the moment. The question is not only whether blacks are adequately represented in organisations, but also which positions they occupy. Tables 15.2 to 15.4 represent three hypothetical situations as illustrated by the association between race and occupation.

**Table 15.2** Perfect association

| | Executive position | Non-executive position | Total |
|---|---|---|---|
| White | 40 | 0 | 40 |
| Black | 0 | 40 | 40 |
| Total | 40 | 40 | 80 |

**Table 15.3:** Moderate association

| | Executive position | Non-executive position | Total |
|---|---|---|---|
| White | 25 | 15 | 40 |
| Black | 15 | 25 | 40 |
| Total | 40 | 40 | 80 |

**Table 15.4:** No association

| | Executive position | Non-executive position | Total |
|---|---|---|---|
| White | 20 | 20 | 40 |
| Black | 20 | 20 | 40 |
| Total | 40 | 40 | 80 |

In these tables we have illustrated a *perfect relationship* between race and executive position (table 15.2); a *moderate relationship* or association (table 15.3) and a situation where there is *no association* whatsoever between the variables (table 15.4). Table 15.2 expresses a perfect relationship – if the category of one variable (race) changes, then the attribute of the other variable (executive position) also changes. In other words, if the race of a staff member is known, one could predict with a hundred per cent accuracy

whether the person occupies an executive or a non-executive position in the organisation. Table 15.3 reveals a pattern of modest association where the two variables are related. More often than not, a prediction about an individual's executive position, based on his/her race, will be correct. Table 15.4 illustrates the situation where there is no association between the two variables.

We would be inclined to suggest, and justifiably so, that these tables respectively reflect very strong, in fact 'perfect', moderate and zero relationships between the variables. The notion of the *strength of the relationship* between variables can therefore be defined as the proportion of times that we correctly predict the categories of the one variable, knowing the values of the other. A high proportion of accurate predictions means that the variables are strongly related; a low proportion indicates a moderate or weak association. Statistical indices of association such as the contingency coefficient, may be computed for the distribution (the set) of scores tabulated above. Ordinarily these indices will range from 0 (no relationship) to 1.00 (perfect relationship).

## Relationships among quantitative variables

A quantitative variable is a variable of which the categories can be represented numerically: someone is thirty years old, has an IQ of 115 and an income of R30 000 per year. When we investigate relationships among quantitative variables (say between age and income), it becomes possible to say whether a change in one variable represents an increase or decrease in the value of another. In addition to indicating strength of relationships, we are now able to specify two other aspects of relationships: direction and linearity.

A relationship can be either positive or negative. A positive relationship exists if an increase in the value of one variable is accompanied by an increase in the value of the other, or if a decrease in the value of one variable is accompanied by a decrease in the value of the other. The two variables change in the same direction (table 15.5).

**Table 15.5** Positive relationships between variables

| Age (years) | Income (per annum) |
|---|---|
| 20 | R15 000 |
| 30 | R30 000 |
| 40 | R45 000 |
| 50 | R60 000 |

There is a negative or inverse relationship between variables if a decrease in the value of one variable is accompanied by an increase in the value of the other. A change in one variable is opposite in direction to a change in the other. A commonplace example is the relationship between distance travelled (measured in kilometres) and petrol remaining in the fuel tank (measured in litres) (table 15.6).

**Table 15.6** Inverse relationship between variables

| Distance (kms) | Petrol remaining (litres) |
|---|---|
| 100 | 40 |
| 200 | 30 |
| 300 | 20 |
| 400 | 10 |

These two examples can be depicted graphically. The lines in the two graphs illustrate the idea of linearity. Figure 15.2 depicts a positive linear relationship and figure 15.3 a negative linear relationship.

**Figure 15.2** Positive linear relationship between variables

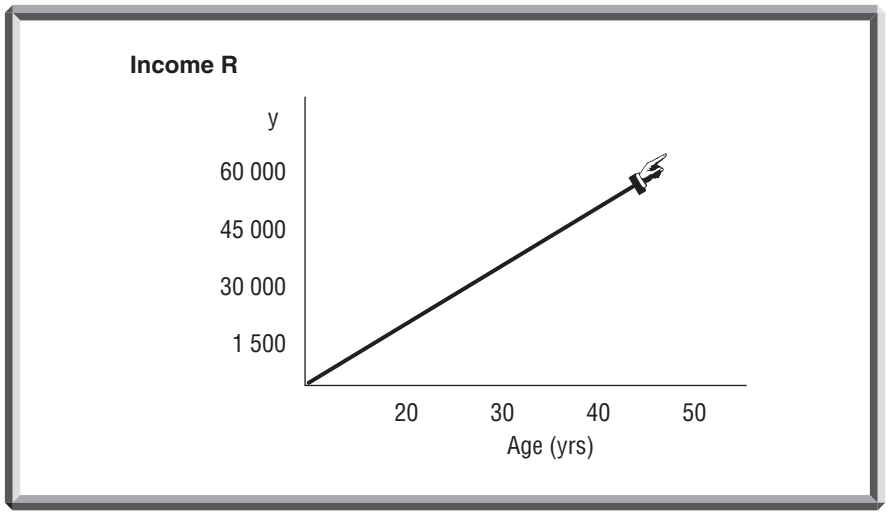
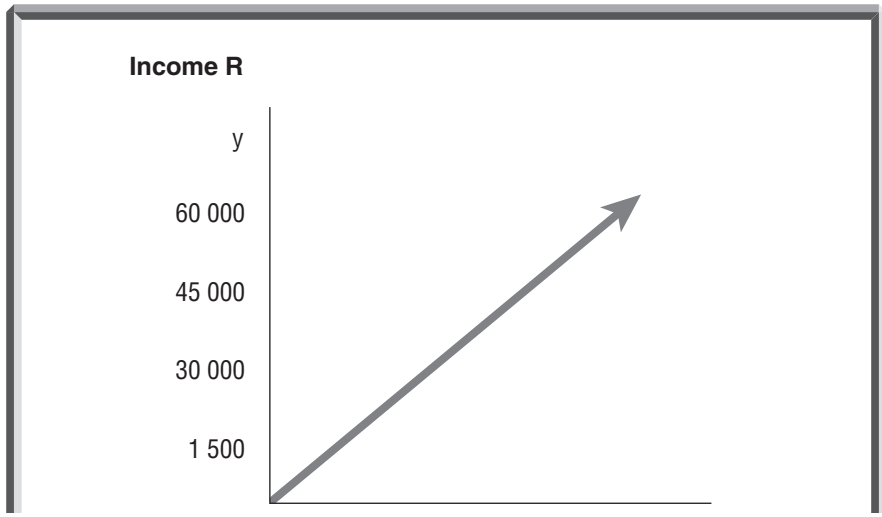
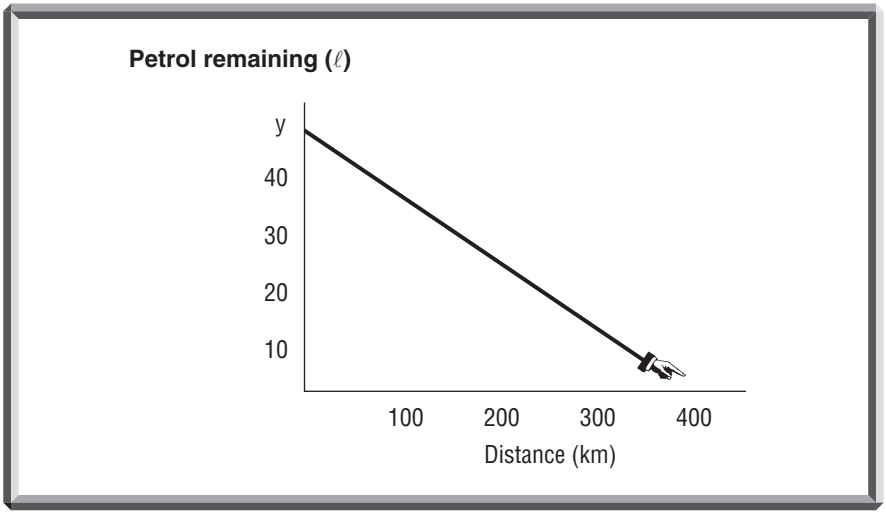



**Figure 15.3** Negative linear relationship between variables



Finally, not all relationships are linear; changes in one variable are not necessarily accompanied by changes in the other variable in one direction only. A typical example in social science is the relationship between stress or anxiety and scholastic performance. Some degree of anxiety is apparently productive and actually results in increased performance. However, at some point, too much anxiety and stress becomes counterproductive and results in reduced performance. This is referred to as a *curvilinear relationship.* In this case, the rate of change in one variable (levels of stress) is not consistent over all the values of the other variable (performance). Another example would be the relationship between age and annual earnings. Up to retirement, earnings will generally increase with age and will then gradually decline. A curvilinear relationship is depicted in the graph below:

**Figure 15.4** Curvilinear relationship between variables




## Summary

This concludes our discussion of different kinds of variables and the relationships between them. Even in the early stages of a research project some understanding of these distinctions is important.

In this chapter we have shown that the formulation of the research problem begins with the identification of the unit of analysis: in other words, what 'kind' of entity in the social world is the object of inquiry. Researchers are typically interested in similarities and differences among people, nations, groups, organisations and so on. The features that distinguish people and other 'entities' in the social world are called 'variables'. We have distinguished between:

- independent or explanatory variables and dependent variables; and
- qualitative or discrete variables and quantitative variables.

PART

3

We have also discussed the notion of 'relationships between variables' and have shown how studies of the relationships between qualitative variables and quantitative variables would differ. Studies of the relationships among qualitative variables can identify the strength of such relationships; while quantitative variables can also identify the direction (positive or negative) and linearity (linear and curvilinear) of such relationships.

## Assignment

1. List the dependent and independent variables of each of the hypotheses tested by Smith and Glanz (reading 3).
2. What are the key variables in Hill's replication study (reading 2)? Illustrate the meaning of the terms 'positive correlation' and 'negative correlation' with reference to this study.

# 16

# *Formulating the research problem (research objectives)*

**Central theme**

Two sets of factors codetermine the clarification of the research objective or purpose: the existing background knowledge and the interests, motives and preferences of the researcher. By cross-tabulating these two sets of factors, we can identify four generic forms or kinds of study in the social sciences.

**Key concepts**

Research objective – research purpose – background knowledge – descriptive and theoretical knowledge – cognitive interests – exploratory studies – confirmatory studies – replication studies – hypothesis-generating studies – basic and applied research.

## Main argument

The research objective or purpose gives a broad indication of what researchers wish to achieve in their research. For example, the aims of a project might be:

- to describe or explain certain phenomena or events or even predict future patterns of behaviour;
- to evaluate a particular intervention or educational programme; or
- to develop new theories or further refine and test existing theories.

We will eventually propose a classification of different types of research goals to present a more systematic picture of different kinds of research objectives. But before doing so, we must address a more basic question: what are the factors that come into play when a researcher identifies a particular research goal? Research goals do not drop from the skies! What makes a researcher decide to opt for a descriptive goal rather than an explanatory one? Which factors play a role in determining a choice for or against evaluating social interventions? I shall argue that there are at least two factors that codetermine decisions about the research goal: the researcher's background knowledge of the particular topic and his/her cog-

nitive interests. In terms of our model in part 1, the first factor refers to the epistemic dimension or existing stock of knowledge and the second to the sociological dimension or the social and biographical context of research. I shall discuss each of these factors briefly before returning to the actual differences in types of research goals.

## Background knowledge (the epistemic dimension)

The state of existing knowledge on the phenomenon to be researched is an important factor in deciding on the specific goals or objectives of a project. The existence of a well-established tradition of previous studies on a specific topic would suggest one kind of research objective. If, on the other hand, there is little or no previous research on the topic, a different kind of research objective would be more appropriate.

Where there is a well-established and long tradition of research in a given sphere (cf. reading 2), then new studies usually aim to test the existing theories and explanations. We will refer to such studies as *validational* or *confirmatory* studies. In cases where very little previous research has been conducted, the researcher will typically attempt to collect new data and develop new hypotheses to explain such data. We will refer to such studies as being primarily *exploratory.*

But we need to be more specific when referring to 'existing knowledge'. For purposes of this discussion we shall distinguish between two kinds of knowledge, namely *descriptive* (or factual) and *explanatory* (or theoretical) knowledge. (For a more detailed discussion, see chapter 28.)

Descriptive or factual knowledge, which includes data, facts, empirical generalisations, narratives and stories, provides truthful descriptions of phenomena in the world. Descriptive statements make claims about *how* things are; *what* the actual state of affairs or fact of the matter is. Explanatory knowledge, which includes theories, interpretations and models, makes causal claims about the world. Explanatory statements suggest plausible explanations of *why* things are as they are; what the causes of events or the causal mechanisms behind change are.

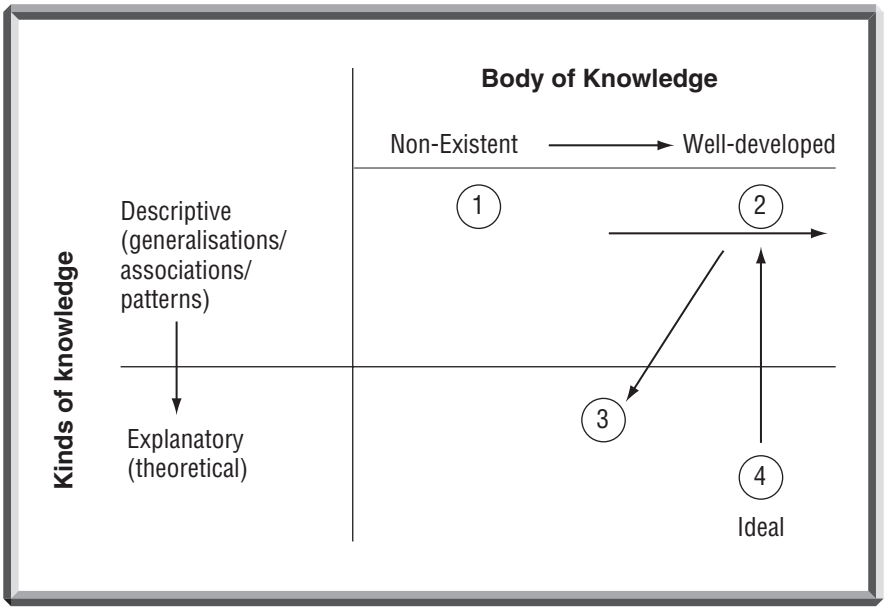
It should be obvious that it is easier to substantiate purely factual or descriptive claims about the world, for instance the claim that 'fifty-five per cent of a sample opposed legalised abortion'. Explanatory or theoretical claims, on the other hand, are much more difficult to confirm. For example, a theoretical statement which claims that 'the reason for the majority being opposed to legalised abortion is the dominance of Catholicism in a particular country', will require a host of evidence including evidence which rules out other possible rival explanations (for instance that the opposition to legalised abortion is related to certain cultural beliefs and traditions rather than to Catholicism).

Our discussion thus far has produced two distinctions:

- A distinction between *exploratory* and *confirmatory* studies, which is a function of the state of background knowledge.
- A distinction between *descriptive* and *explanatory* studies, which is a function of the difference between kinds of knowledge.

When these distinctions are cross-tabulated they suggest the following typology of research studies in the social sciences as illustrated in figure 16.1.

**Figure 16.1** Typology of research studies in the social sciences




The numbers in the diagram refer to four generic kinds of studies. We have to emphasise, though, that these four kinds of studies are very broad ideal-types. The aim of the typology is to make us aware of certain distinctions that are helpful in identifying and understanding different kinds of studies in social research.

### Exploratory studies ①

The aim of such studies, which would include pilot studies and other kinds of qualitative research, is to establish the 'facts', to gather new data and to determine whether there are interesting patterns in the data. Tan, Li and Simpson's study of the influence of American television programmes on the formation of stereotypes amongst foreign audiences is closest to this category (cf. reading 4).

### Replication studies ②

Where there is already a well-developed body of evidence or knowledge on a topic, it is sometimes important to replicate and validate previous findings. This is done for various reasons, but mainly to establish whether the same results will be obtained with different samples of subjects under different conditions and time frames. Hill's replication of Schuman's work on the relationship between study time at university and grades achieved is an example (cf. reading 2).

PART 3

### Hypothesis-generating studies ③

Empirical findings, as expressed in patterns and generalisations, have to be explained and this is precisely the aim of the bulk of empirical research, namely to generate plausible explanations or accounts in the form of hypotheses (cf. reading 1 and reading 3).

### Theory-testing studies ④

In certain areas, there are well-established and highly plausible theories such as modernisation theory, socialisation theory and social learning theory. A significant proportion of empirical research is aimed at testing and validating such theories (cf. Giorgi's validation of Martin's secularisation theory in reading 1).

The second factor that influences the formulation of the research problem is the researcher's cognitive interests.

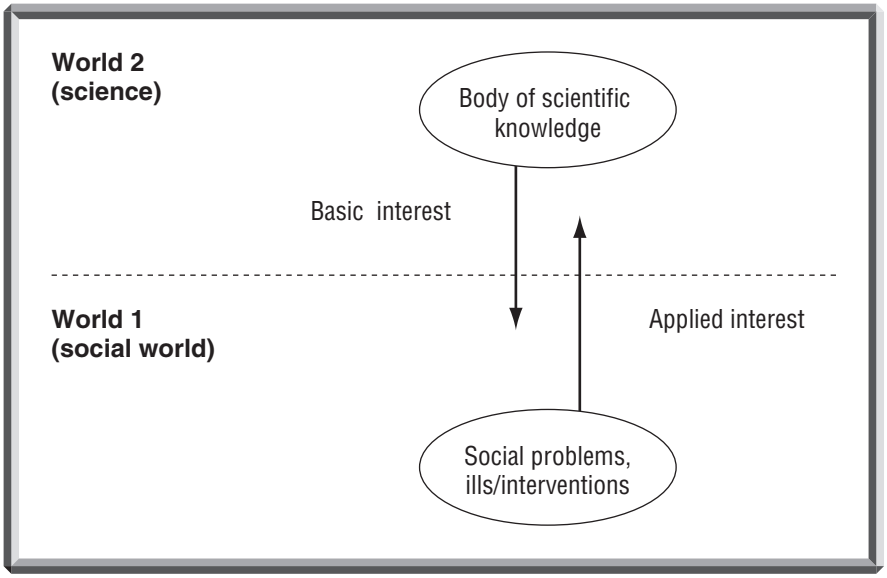
## Cognitive interests (the sociological dimension)

'Cognitive' interests are those factors that motivate or drive the researcher to undertake a particular study. What are his/her reasons for undertaking the particular study? Some of these reasons might be very specific to the individual concerned while others might be more closely linked to institutional and other social concerns. Individual interests could include 'mundane' objectives such as getting a post-graduate degree or undertaking a research project under contract. Institutional interests would be interests that are linked to the researcher's institutional 'home' or base. Research is undertaken in various institutions and environments such as academic departments, think-tanks, government-funded bureaus, commercial research houses and development agencies. As argued in chapter 8, the institutional context of research affects research in many ways (compare the discussion on the 'sociological dimension of research'). This discussion is especially pertinent to the way in which the broader social context influences and even determines the formulation of research problems.

In research textbooks it has become accepted practice to distinguish between predominantly basic or academic research on the one hand, and predominantly applied research on the other, in order to demonstrate how different kinds of interests affect the problem formulation. This distinction is clearly one of degree. In fact, as the figure below suggests, it is more a question of perspective and intention than of black and white.

The main purpose in the more basic or academic research is to contribute to the existing body of scientific knowledge. This is not to say that such research does not aim to make a contribution to our understanding of the social world. But the focus, the point of departure, is in the World of Science. Typically such research consists of asking questions such as the following: Is this theory or model correct? How can we improve our understanding of X? How do we test this hypothesis? In what areas of my discipline or research domain are there clear deficiencies and lack of data?

**Figure 16.2** Basic and applied research




The more applied research, such as policy research and social problems research, takes a certain problem in the social world as its point of departure. Its primary purpose is to solve a social problem or to make a contribution to real-life issues. Examples would be: How do we solve the housing shortage in this area? Has this literacy programme been effective in this rural area? What are the causes of unemployment in this town?

## Concluding comments

It has been the aim of this chapter and the previous one to analyse the notion of a 'research problem' or 'research question' and to describe the decisions involved in the formulation of a research problem. The importance of the formulation of the research problem in the process of social inquiry cannot be overemphasised. Let me return to the analogy of the traveller. One could conceivably embark on a journey without knowing anything about the terrain to be traversed or the destination that might be reached. In fact, the pioneer explorers in olden times did exactly that. But it is far more common and reasonable to embark on a journey when you have a clear idea of where you want to go and some knowledge of the route that will get you there. It is reasonable precisely because knowledge of the route and the destination makes both the planning and the execution thereof far easier and more cost effective.

These same principles – but to a much greater degree – are basic to the practice of science. It is conceivable, and unfortunately too common, for researchers to embark on a study without any knowledge of the research domain or the specific unit of analysis and with only the vaguest notion of what the goal of the study is. But rational decision-making requires and dictates a clear formulation of the research problem: what we wish to inves-

PART

3

tigate and to what end. The research problem or question must be adequately clarified before a study can be designed and executed in a way that will ensure optimal results. A clear and unambiguous research problem is a precondition for the next series of decisions in the research process.

## Critical reflection and assignment

Read through readings 1, 2, 3 and 4 and in each case formulate the *research objective or purpose* of the particular study clearly.

# 17

# *Research design*

**Central theme**

A well-defined research problem is a precondition for any study. The development of a research design thus follows logically from the research problem. A 'research design' is defined as 'a set of guidelines and instructions to be followed in addressing the research problem'. The main function of a research design is to enable the researcher to anticipate what the appropriate research decisions should be so as to maximise the validity of the eventual results.

**Key concepts**

Research design – maximising validity – minimising error – external and internal validity – generalisability.

## Main argument

In our analogy between research and travel we compared the research design of a project to a journey planner or itinerary. If we consider what goes into the planning of a journey we get some idea of the functions of a research design. On having decided on my destination, I must, as a traveller, consider the best route by means of which to reach it. 'Best' implies taking into consideration factors such as time of the year, costs, mode of transportation and the route. In planning the journey I am constrained by what my travel agent and I know about the route from existing maps and guidebooks, and by resources like time and money. But I shall eventually produce an itinerary that meets my needs and which I will follow to reach my destination. A research design is like a route planner. It is a set of guidelines and instructions on how to reach the goal that I have set for myself.

The notions of 'plan' and 'design' are commonly used in the construction industry where drawing up building plans or architectural designs invariably precedes the actual construction of a building. Similarly, the research design could be viewed as the 'blueprint' of the research project that precedes the actual research process.

Building plans and blueprints are step-by-step outlines of what needs to be done. They specify the materials and the specifications according to

which they are to be used, the critical deadlines against which particular stages must be completed, and so forth. In the construction industry such plans and designs are necessarily very detailed. But in other spheres of everyday life, designs differ in their degree of articulation and detail. Someone who wishes to design a new dress might have only a very general 'picture' or 'idea' in her mind of how the design should look. An artist who composes a new picture might have only the faintest of ideas when starting out.

Designs differ in terms of detail and finality. A major determining factor in this process is the degree of control that is deemed necessary for the project. Control and planning are paramount considerations where the risk of error is high and disastrous consequences could result if things are not well planned. This is typically the case where lives are at risk, as in the case of the construction of a bridge or an apartment building. In other cases, where the question of risk is less important, designs are more flexible, open-ended and less fixed.

Although we do not usually encounter similar degrees of risk in the social sciences the distinction remains valid. Certain areas of pharmaceutical and medical research are obviously high-risk fields. In highly structured research such as experimental designs aimed at testing research hypotheses, the design is a framework of clearly formulated decision steps. In a semi-structured and open-ended project such as qualitative exploratory research aimed at developing new hypotheses, the design is more flexible.

We can once again illustrate this with our analogy of a journey. If I embark on a business trip which will hopefully see the conclusion of months of extended negotiations and the closing of a multimillion rand contract, I will ensure that all my travel arrangements are taken care of well in advance, even to the extent of making contingency plans should something go wrong. In contrast, if I am embarking on a leisurely trip along the West coast and I intend to explore the area in my own time, questions of meeting deadlines, making bookings, and contingency plans may not even arise.

This discussion illustrates the importance of the research problem in a project. The structure and particular logic of a research design is determined by the formulation of the research problem. The degree of structure in our design will be a direct function of the research goals that we have set for ourselves.

## Elaboration: research design as maximising validity

Our construction and travelling examples have shown that the need for design and planning is most urgent when errors and mistakes have to be eliminated. This even applies to research where the design is relatively open-ended. Although it is seldom possible to plan a project in such detail that all error will be eliminated, it is usually possible to identify certain typical threats to validity and to adjust one's design accordingly. The rationale for a research design is to plan and structure a research project in such a way that the eventual validity of the research findings is maximised through either minimising or, where possible, eliminating potential error.

## The notion of validity

In chapter 6 we argued that 'validity' should be viewed as a synonym for 'best approximation to the truth'. Very briefly, our argument there was that, although scientists work under the epistemic imperative or search for truth, there are various ontological and sociological constraints that seriously curtail the attainment of this ideal, except in the simplest cases of singular descriptive statements. This does not mean that we should abandon the search for truth, only that we have to accept that at best our research can only produce better or worse approximations of the truth.

But merely setting our aims lower – from attaining truth to aiming at approximation of the truth above absolute truth – does not by itself clarify the notion of 'validity'. The key question is: how does one recognise valid research? How does one know when one study is more valid than another? These are essential questions, because unless we have a clear idea what the criteria for 'validity' are, there is no sense in defining the function of research designs as 'maximising validity'.

Our approach is as follows: first, we have to identify the key dimensions of validity. Secondly we argue that the only feasible way to 'maximise validity' is by either minimising or eliminating all foreseeable threats to validity in the research process.

The above discussion suggests that we should regard 'validity' as a criterion that is applicable to the whole research process. One way to do this is to look at the change in the meaning of 'validity' when applied to each of the main stages in the research process. In the following discussion of the stages in the research process, we shall identify, in each case, (1) the stage in the research process; (2) the major sources of error (the main threats to validity), (3) the particular 'outcomes' or 'products' of that stage in the research process and (4) the appropriate criterion of validity as it applies to that outcome.

We need to emphasise that 'validity' is an epistemic criterion, which means that it is a quality of the elements (data, statements, hypotheses, theories and methods) of knowledge. These knowledge elements are the products of the various stages of decision making in research. The actual process of decision making is more or less objective. Objectivity is a criterion of the process, which means that it is a methodological criterion. We would therefore argue that research uses relatively objective methods when conceptualising, sampling, defining, analysing and collecting data. Let us elaborate. In each case in the discussion below, we (1) define what is understood by the particular stage in the research process; (2) identify the epistemological criterion (what 'validity' means); and (3) identify methodological criteria appropriate to the particular stage.

## 1 Conceptualisation

'Conceptualisation' refers to both the clarification and the analysis of the key concepts in a study and also to the way in which one's research is integrated into the body of existing theory and research. As far as the first meaning is concerned, 'conceptualisation' is synonymous with 'conceptual analysis' and involves the clear and unambiguous definition of central concepts.

'Conceptualisation' also refers to the underlying theoretical framework that guides and directs the research. When the research question or problem is formulated in the form of a research hypothesis, two of the important epistemic criteria are empirical testability and explanatory potential. The question surrounding empirical testability is whether one can foresee or even indicate how the hypothesis will be tested. The question of explanatory potential refers to the degree of theoretical support or embeddedness enjoyed by the hypothesis. If the hypothesis is derived from an established theoretical framework that has been successfully applied to explain similar phenomena in the past, it (potentially) strengthens the conclusions that could be drawn from the research. If not, the particular hypothesis has still to 'prove itself'. The 'outcome' of the conceptualisation phase is a research hypothesis which should, I suggest, meet the criterion of 'theoretical validity'.

## 2 Operationalisation

During the process of operationalisation a measuring instrument such as a questionnaire or scale is developed. Ideally, this instrument constitutes a valid measure of the key concepts in the research question. The outcome is a measuring instrument and the predominant epistemological criterion is measurement validity. It has become customary to distinguish aspects or dimensions of measurement validity such as face validity, construct validity, criterion and predictive validity.

What methodological criteria are applicable in the construction of valid measuring instruments? We shall mention a few. Firstly the population from which one selects items to construct the instrument must be exhaustive with regard to the phenomenon being investigated. Secondly the categories used in the scale or questionnaire must be unambiguous and mutually exclusive. Thirdly scales must meet the criterion of unidimensionality, which means that a single scale cannot be used to measure two or three different dimensions or aspects of a phenomenon.

## 3 Sampling

During the process of selecting or sampling the aim is to get a sample that is as representative as possible of the target population. Representativeness is the underlying epistemic criterion of a 'valid', that is, unbiased sample. The methodological criteria applied in the process of sampling are: clear definition of the population, systematic drawing of the sample, drawing probability rather than non-probability samples and observing the advantages of multi-stage versus simple random sampling.

## 4 Data collection

During data collection, the researcher collects various kinds of empirical information or data, for instance historical, statistical or documentary data. This is accomplished through various methods and techniques of observation such as document analysis, content analysis, interviewing and psychometric testing. There are a number of methodological criteria that ought to

be followed during the process of data collection. These include suspension of personal prejudices and biases, systematic and accurate recording of the observations, establishment of trust and rapport with the interviewee and creating optimal conditions in terms of location or setting for the collection of the data.

The outcome of the process is a set of data or empirical information and the epistemological criterion is that of reliability. We aim to produce reliable data. This means that if we were to use the same measures and hold the conditions under which the data are collected as constant as possible, we should get the same data from situation to situation. Reliability is hence synonymous with stability or consistency over time.

## 5 Analysis and interpretation

We analyse data by identifying patterns and themes in the data and drawing certain conclusions from them. What are the methodological analysis criteria? Using appropriate statistical techniques for the appropriate level measurement and so on. Drawing inferences according to the principles of statistical inference (the whole logic of hypothesis testing).

The outcome of the analysis or interpretation is certain conclusions which must follow logically from the empirical evidence if it is to be regarded as 'valid' results or conclusions (epistemological criteria).

The discussion thus far can be summarised in what I will refer to as the validity framework as reflected in table 17.1.

**Table 17.1** The validity framework

| Stage in research process | Sources of error | Methodological 'move' or 'strategy' (objective research) | Outcome/goal/ end-product | Epistemic (validity-related) quality or criterion |
|---|---|---|---|---|
| Conceptualisation (conceptual analysis) | Complex notions<br>Vagueness<br>Ambiguity<br>Abstract concepts | → Thorough literature review<br>→ Clear and logical definitions | Concepts/ definitions | Theoretical validity (clarity/scope) |
| Operationalisation | Poor sampling of items<br>Leading questions<br>Scaling errors | → Scale validation<br>→ Face validity<br>→ Pilot test | Measuring instruments | Measurement validity (construct validity) |
| Sampling | Bias<br>Heterogeneous populations<br>Incomplete sampling frame | → Probability sampling<br>→ Stratification<br>→ Optimal sample size | Sample | Representativeness |
| Data collection | Observation effects<br>Interviewer bias<br>Respondent bias<br>Context effects | → Multi-method<br>→ Proper training of fieldworkers | Data sets | Reliability |
| Analysis/ interpretation | Competing/rival conclusions or explanations | → Appropriate techniques of analysis<br>→ Thorough understanding of literature | Conclusions/ results/findings | Inferential validity |

PART 3

## Summary

The dimensions of *validity* are:

- theoretical validity;
- measurement validity;
- representativeness;
- reliability; and
- inferential validity.

Corresponding to these are the dimensions of *invalidity* or *error:*

- conceptual vagueness;
- measurement error;
- biased samples;
- unreliable data; and
- invalid conclusions.

This framework is helpful because it illustrates two important points about the pursuit of validity.

First, the relationship between the methodological dimension (the *how?*) and the epistemological dimension *(to what end?)* becomes clearer. As argued in chapter 3, the relationship between the methodological and epistemological dimensions can be expressed as a *means-end* relationship. The epistemological ideal of 'validity' specifies the goal of all research; the methodological ideal of 'objectivity' specifies how to attain this goal. Objectivity is a criterion or value of the process and of the methods and procedures used in the process; validity is a value or property of the 'knowledge entities' or 'knowledge structures', namely the statements, propositions, hypotheses, theories and data statements. From the validity framework in figure 17.1 it should be clear that objectivity is a precondition for the attainment of validity in research.

The fact that objective research is a precondition for the attainment of valid findings means that objectivity must be pursued during each stage of the research process *and* that, as in a chain, each link is essential if the goal is to be attained. Each stage is dependent on the pursuit of objective research in the previous one. Each stage builds on the one preceding it.

Secondly the framework is also useful because it actually suggests *how* research must be designed to attain valid results. In chapter 3 it was emphasised that, by defining 'validity' as 'the best approximation of truth', we do not necessarily solve the problem of knowing when we have attained validity. But it is precisely by making the link between objectivity and validity explicit and by distinguishing between the various dimensions of both, that a solution to this challenge emerges.

The pursuit of objectivity in research is based on taking decisions and making judgements to avoid certain pitfalls that would lead to bias and error. Objective research is research that either totally avoids such pitfalls or, in some way, controls for their effects. Through methodological research and decades of social research we are now able to identify many of these pitfalls or 'threats' to objectivity and validity. These would include

vague research questions, biased instruments, biased sampling, samples that are too small and conclusions that are not supported by the evidence. It is precisely in the identification of these 'threats' and their causes, which include heterogeneous populations, poorly trained interviewers, untested questionnaires, leading questions in questionnaires, culturally biased tests and uncooperative research subjects, that research design plays a role. The flip-side of maximising validity is to either eliminate or minimise threats to objective research.

This is precisely the approach that will be followed in the remaining chapters in this section of the book. In each chapter the threats to objectivity and validity that are specific to that stage in the research process are discussed and strategies are recommended to counteract them.

## Critical assignment

Study any of the four readings at the end of the book. List possible pitfalls or sources of error that you can identify in the study that you have selected. Indicate whether and how the authors have attempted to reduce the effect of these potential sources of error in their respective studies.

# 18

# *Conceptualisation (defining key concepts)*

**Central theme**

Conceptualisation means, in the first place, to define the key concepts in the problem statement. In this sense, 'conceptualisation' is synonymous with terms such as 'conceptual clarification' and 'conceptual analysis'. The notions of 'concept', 'connotation' and 'denotation' and the criterion of 'conceptual' or 'theoretical validity' are also discussed.

**Key concepts**

Conceptualisation – conceptual analysis – theoretical concepts – constructs – theoretical validity.

## Main argument

The term 'conceptualisation' is used here as a synonym for 'conceptual analysis' or 'conceptual explication'. Assume that a researcher has decided to conduct a study to establish the relationship between political conservatism and racial prejudice. Even a person with no training in the social sciences would know that the concepts 'conservatism' and 'racial prejudice' have many connotations. In our everyday life these concepts form part of commonly held attitudes and value orientations. In the language game of the social sciences, the concepts have become embedded in a variety of models and theories in sociology and political science. It is obvious that familiarity with the most important theories relating to the research problem is an essential precondition for an adequate conceptualisation.

One of the most striking characteristics of theories in the social sciences is the incidence of highly abstract and multidimensional concepts. In the social sciences, concepts such as values, culture, solidarity, maturity, meaning, power, peace, revolution, alienation, anomie, structure, function, rite, religion, depression, social distance, anxiety, aggression, motivation, intelligence and success are unavoidable.

Many of these concepts have their roots in the world of social sciences research and are therefore usually linked exclusively to certain theories or models. However, even concepts such as power, freedom and revolution,

which are part and parcel of everyday life and language, acquire new meaning when they become integrated in a theory in the social sciences such as, for example, that of Karl Marx. The fact that concepts acquire meaning, or even new meaning, within a conceptual framework such as a theory, a model or a typology, has led philosophers of science to refer to such concepts as 'theoretical concepts' or 'constructs'. In chapter 20, we shall demonstrate that the aim in empirical research is to operationalise such constructs meaningfully by rendering them either measurable or observable. In the next section, we shall discuss in some detail how a highly theoretical sociological concept such as 'alienation' can be explicated by means of theoretical definition, after which the notion of 'theoretical validity' will be defined more clearly.

### Example: alienation

Although Hegel was the first author to use the term 'alienation' in a theoretically interesting manner, Karl Marx is generally accepted as the first person to have developed a consistent and systematic theory about the concept. Marx endorsed Hegel's view that alienation is a reality that arises when an individual feels that he or she has lost control. However, Marx differed from Hegel, Feuerbach and others in his view of the origin of alienation. He believed that it stemmed from economic factors, and more specifically that it was a consequence of capitalism:

> *In what does alienation consist? First that the work is external to the worker, that it is not a part of his nature, that consequently he does not fulfil himself in his work but denies himself … His work is not voluntary but imposed, forced labour. It is not the satisfaction of a need, but only a means of satisfying other needs. The object produced by labor, its product, now stands opposed to it as an alien being, as a power independent of the producer … The performance of work is at the same time its objectification. This performance appears, in the sphere of political economy, as a vitiation of the worker, objectification as a loss and as servitude to the object, and appropriation as alienation* (quoted in Nisbet, 1974:291).

One can only really understand this paragraph against the backdrop of Marx's emphasis on the importance of human beings as labourers or makers ('homo faber'). A human being attains self-realisation through labour or productivity. According to Marx, the capitalist system, as it existed at the time of his writing, resulted in human beings being alienated from the product of their labour by a system of unequal and unjust relations of production. This system therefore separated people into two clearly identifiable classes: the owners (bourgeoisie) and the workers (proletariat). The fundamental inequity of the system stems from the structure of the production process. In relative terms, according to Marx, the worker contributes more to the actual production process, while the owner derives a far greater benefit. The worker's productive ability is reduced to an object or thing (reified). In other words, it is regarded as simply one more commodity on the market. Alienation therefore inevitably results when a quality which is intrinsic to the existence of man is reduced to a mere object or commodity.

PART 3

The first clear definition of 'alienation' was therefore encountered in Marx's economic theory. Despite the fact that it is a highly theoretical and abstract concept, we now have a clearer grasp of its meaning. The reason for this improved understanding is of the fact that the relationship between 'alienation' and better-known concepts such as 'labour', 'production relationships' and 'inequality' have been clarified within the framework of a theory. These concepts are obviously still highly abstract terms. Nonetheless, the fact that the term 'alienation' has been embedded in a network of other related concepts, leads to a more precise definition of its meaning.

In 1959 Melvin Seeman published an article entitled *On the meaning of alienation* in which he further elucidated the notion of 'alienation'. His point of departure was that it was possible to define modern mass society more clearly by emphasising five essential structural elements, namely:

- the development of impersonality and a reduction of relationships as a result of differences in status;
- the development of a bureaucracy that leads to secularisation;
- an increase in social differentiation and job specialisation;
- increasing social mobility; and
- an increase in scale or size.

According to him, these five elements are fundamental to three factors that are relevant to alienation, namely loss of control over work and product, lack of integration within large organisational structures, and a low level of accessibility to reward values. Seeman maintained that the objective alienation in mass society eventually leads to five socio-psychological phenomena:

- powerlessness;
- normlessness;
- isolation;
- self-estrangement; and
- meaninglessness.

Each of these five phenomena are subsequently defined in greater detail. Powerlessness refers to an individual's perception that he does not have complete control of his behaviour. Normlessness refers to the perception that socially unacceptable behaviour is necessary for the attainment of specific goals.

Meaninglessness may be defined as a low expectation of being able to make meaningful predictions about future consequences of behaviour. Isolation is a tendency to attribute limited value to convictions or ideals that are typically highly valued. Self-estrangement indicates a degree of dependence on specific forms of behaviour for expected future consequences of behaviour.

This is obviously a coherent theory. An explanation of the causes of alienation is provided (expanding bureaucracy, increased social mobility, increased impersonality and so on). As demonstrated by Marx, conceptual

analysis by means of theoretical definition clearly involves explication of the concept by using other concepts that are sometimes more familiar. In the subject under discussion the concepts of powerlessness, normlessness, meaninglessness, isolation and self-alienation were used.

In other definitions of alienation different dimensions of the concept are emphasised. Keniston emphasises the distinction between alienation from society and self-alienation:

> *In societies in which the transition from childhood to adulthood is unusually painful, young people often form their own youth culture with a special set of anti-adult values and institutions, in which they can at least temporarily negate the feared life of the adult … (Self-alienation refers to) alienation of man from his own creative potentialities, embedded in his fantasy life* (1960:163–164).

In his typology of the dimensions of alienation, Stroup (1961) included indifference, isolation, self-estrangement, powerlessness, loneliness, meaninglessness, disenchantment and anonymity. The attempts of other scientists to define 'alienation' more precisely in different theories and typologies could also be referred to. However, these examples will suffice.

## Elaboration: theoretical validity

What is involved in the theoretical definition of concepts? Concepts, or rather constructs, such as for example, alienation typically have many 'shades' of meaning – a variety of connotative elements. Theoretical concepts are rich in connotation. One could use the analogy of a field of meaning to illustrate this idea. Wittgenstein uses the term 'family of resemblances'.

Within a given field of meaning, certain dimensions or aspects of meaning are more closely associated than others. Together, these dimensions within a field of meaning constitute the connotation ascribed to the concept. The relationships between these dimensions in meaning is not a matter of coincidence – it is not simply given. It is only within the framework of a theory or model that such relationships are systematically defined. And this is the function of a theoretical definition: to arrange or logically systematise the most important dimensions of the meanings of theoretical concepts.

In this context, to arrange logically implies that the logical rules of correct classification, and the rules of mutual exclusion and exhaustiveness have to be adhered to. This can be explained as follows: Assume that we needed to develop a classification of types of societies on the basis of their levels of development. The 'principle of classification of' or the 'dimension along which' societies are classified is 'level of development'. The classification that we apply is the following: industrialised societies, agrarian societies and high-technology societies. Obviously this simple typology would not be acceptable because there is a large degree of overlap between the first and third categories; they are not mutually exclusive. This is one way of saying that the principle of classification has not been adhered to. The

distinction between 'industrialised societies' and 'high-technology societies' is not sufficiently clear because they both cover a similar part of the dimension of 'level of development'.

Using the example of alienation, we have been able to demonstrate that a good theoretical definition implies that the essential dimensions of the meaning of a concept have been identified, and that, as far as possible, these dimensions are mutually exclusive. On face value, Stroup's typology would appear to be lacking in terms of compliance with the second requirement in that the dimensions of isolation and loneliness, and also what he calls indifference and disenchantment, could be regarded as overlapping categories. On the other hand, Seeman's five dimensions appear to be valid, exhaustive and mutually exclusive categories, even on cursory inspection.

But the notion of 'theoretical validity' should not be confined to conceptual clarity. Rose, following Phillips (1966), introduced the term 'internal theoretical validity' and listed three characteristics of acceptable theoretical explication. These are 'clarity', 'scope' and 'systematic import'. Rose described each of these terms as follows:

> *Clarity is the concept's potential for leading to indicators, which depends on the degree to which it implies a chain of lower-level concepts; scope is the breadth (or narrowness) of the class of phenomena to which the concept applies; and systematic import is the extent to which the concept is used in propositions and theories* (1982:40).

We rarely, if ever, judge a theory solely in terms of conceptual clarity. We also ask whether it explains a lot of phenomena (scope or explanatory potential) and also how integrated the various concepts and statements of the theory are (systematic import).

Because the connotative and denotative dimensions of concepts are so closely related, the ultimate test of a theory, model or typology is the extent to which it leads to valid information on the phenomena that it is supposed to describe or explain.

## Critical assignment

In reading 1, Giorgi defends a specific definition of the concept of 'religiosity' and also propounds a distinction between 'religiosity' and 'the religious'. Reconstruct and summarise her arguments. Why is it important to Giorgi to make this distinction?

# 19

# *Conceptualisation (formulating research hypotheses)*

**Central theme**

Conceptualisation also means 'integrating one's study into a larger conceptual framework'. It is essential to relate one's work to an existing body of theoretical and empirical knowledge. One way of doing this is to frame empirically testable research hypotheses, either by deriving them deductively from well-established theories or by basing them on observation of phenomena and events in everyday life.

Key concepts

Literature study – assumptions – presuppositions – hypotheses – postulates.

## Main argument

What do we mean when we refer to the 'conceptualisation' of a study over and above the definition of our key concepts? In this chapter we will demonstrate that 'conceptualisation' also involves *embedding or incorporating* one's research into the body of knowledge that is pertinent to the research problem being addressed. To do this, the researcher must first do a thorough literature search of previous theoretical and empirical work in this field and then relate her work to the existing literature. What does this mean and why are literature reviews important?

1. A literature review serves as a 'map' or 'maps' of the terrain. With reference to our analogy of the journey, we have to realise that other researchers have 'travelled' this way before. In areas where there has been a concentrated focus on a specific phenomenon, a researcher has an obligation to acquaint herself with any publications on major research already conducted in the field, the most widely accepted theoretical positions and the most recent debates.
2. A review of previous research also provides guidelines, or at least suggestions, on the design of one's own project. By studying previous studies on a particular topic, one not only learns about the 'maps' and

'guidebooks', but also about the 'itineraries', that is the different ways that people have travelled this terrain.

3. An intensive study of the existing body of knowledge yields various kinds of 'resources'. These include conceptual resources such as useful theoretical formulations or definitions of key concepts that are encountered in a specific field; methodological resources, such as a reliable and valid scale or questionnaire; and appropriate examples of qualitative and quantitative techniques.
4. Literature searches are sometimes done by researchers who intend to replicate previous research (reading 2). In such cases one is interested in both the methodology and the substantive results of previous research.
5. Finally, anyone planning to research a field which has hitherto enjoyed limited attention, either worldwide or locally, can learn a great deal by studying related fields and from the designs and methods used.

When we refer to a literature review as a kind of 'research map', we must bear in mind that there are different kinds of research maps. When planning a journey we have a choice of any number of maps including large-scale maps of countries, detailed town maps, guidebooks to countries and cities, and guidebooks that provide historical information as well. Similarly, there is a range of resources from which to choose when a literature review is undertaken. There are specific resources for specific research reviews. A simple classification of these resources and their main applications is given in table 19.1.

**Table 19.1** Sources for literature searches

| Kind of literature source | Application |
|---|---|
| Dictionaries, encyclopaedias, textbooks | 1. Provide *standard* definitions of central concepts in a discipline.<br>2. Provide descriptions of main research areas.<br>3. Provide useful historical overviews of main figures and traditions in a discipline. |
| Annual reviews, state-of-the-art reviews (usually in special editions of journals) | 1. Usually include *authoritative* reviews of the most prominent theories and research in *specific* problem areas.<br>2. Include succinct statements and discussions of *key* debates and issues. |
| Monographs/books | 1. Comprise extended and well-contextualised in-depth studies on topics.<br>2. Normally include well-documented theoretical arguments on key issues in current debates. |
| Journal articles | 1. Include *topical* discussions on the latest theoretical and empirical issues.<br>2. Include brief reports on key findings and new advances in methodology.<br>3. Include book reviews and discussions. Articles are useful 'second-order' introductions to primary sources. |

How does this classification relate to our discussion of types of research in chapter 16? In broad and somewhat simplified terms, the following guidelines apply:

The more exploratory and open-ended the study, the more useful it will be to look at general sources such as encyclopaedias and review articles and also to use broad search strategies.

For more validational and structured studies, it is more useful to consult subject literature such as books and journal articles and to use more focussed search strategies.

The level and context of the research project is an equally important consideration. In chapter 26 we shall discuss, in greater detail, the fundamental differences involved in writing undergraduate assignments, master's theses, doctoral dissertations and journal articles. We shall discuss the differences in the kind of literature review required for each of these situations, and also the style of reporting.

In summary then: a survey of the literature is an essential component of any study because it is the main access point or gateway to the relevant body of knowledge. Through reading and studying the work of other academics, we learn how to improve our own research methods, ask the right questions *and* identify potentially useful answers to such questions. In fact, the body of literature is best viewed as a three-dimensional space (virtual reality) that can be explored by a researcher to best locate and position her own work.

In the previous chapter we focussed on the issue of conceptual analysis and the meaning of conceptual or theoretical validity. We showed how a study on alienation would benefit from a review of the theories on alienation and specifically what it means to arrive at a conceptually valid definition of highly abstract concepts.

Another important reason for reviewing the literature is that it provides ideas, hypotheses and conjectures for one's own research. The remainder of this chapter is devoted to a discussion of the distinction between different kinds of hypotheses and between hypotheses, assumptions and postulates.

## Elaboration: kinds of hypotheses

Scientific statements differ with regard to the degree of evidentiary support that they enjoy. In this respect it is customary to distinguish between 'hypothetical statements' or 'hypotheses' and 'substantiated or validated statements', to which we usually refer as 'empirical statements' (cf. chapter 28 for a detailed discussion on scientific statements).

When we first formulate a statement without knowing whether we have any empirical warrant to accept it as reasonably valid or even true, we call this a hypothesis. A hypothesis is a statement that makes a provisional or conjectural knowledge claim about the world. A 'good' hypothesis is empirically testable, which means that we must be able to specify clearly what data would provide support or rejection for it. Before discussing the criteria for a 'good hypothesis' we must distinguish between different kinds of hypotheses.

PART 3

## Existential and relational hypotheses

Hypotheses can be classified into two main groups, namely existential and relational hypotheses. An *existential* hypothesis is a provisional statement about a certain state of affairs, that is, it makes a claim that something *is* the case. For example:

- Sixty per cent of rural South Africans are functionally illiterate.
- More than seventy per cent of all South Africans are opposed to legalised abortion.
- Durban has the highest crime rate in the country.

Statements such as these are claims that a certain *entity* (a group of individuals, a city) has a certain *property* (being illiterate, adopting attitudes towards abortion, crime rate) and what the *value* of that property is (a certain proportion or a rank-ordering). Existential hypotheses are more common in exploratory research where the main purpose is to find out what the case is.

Relational hypotheses postulate that a certain kind of relationship exists between two or more variables (cf. our discussion on 'relationships between variables' in chapter 15). It has become customary to distinguish further between *correlational* (or descriptive) hypotheses and *causal* (or explanatory) hypotheses, depending on the kind of relationship that is being postulated.

A correlational hypothesis might claim that there is a positive or negative relationship between people's educational level and their tolerance of other people, that there is a relationship between stress and productivity. The first hypothesis postulates a positive relationship, namely that tolerance of other people or groups increases as level of education increases. The second hypothesis postulates a negative relationship, namely that, as stress in the workplace is increased, workers become less productive.

## Singular and general hypotheses

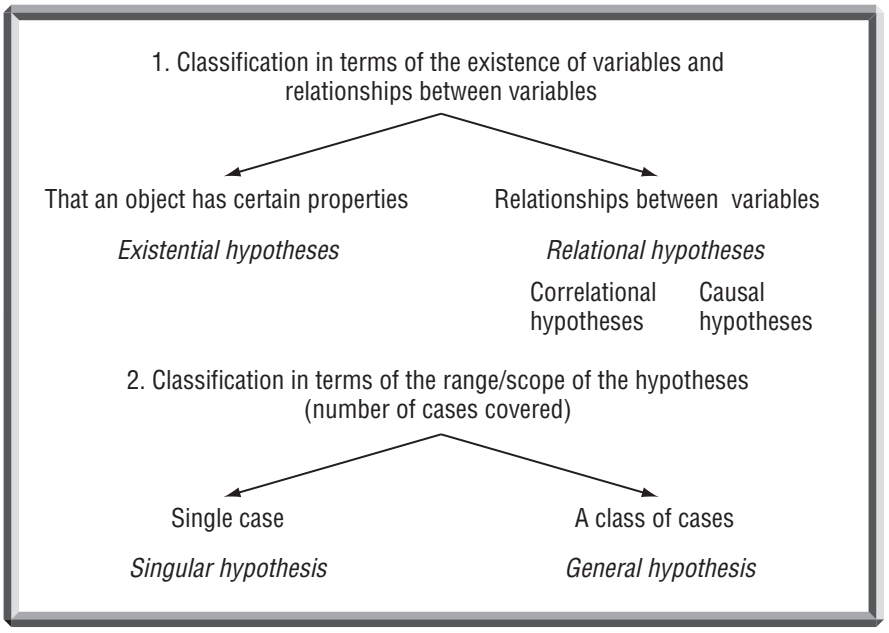
Another classification of hypotheses addresses the scope or range of the hypothesis, depending on whether a hypothesis applies to only one case (*singular* hypothesis) or to a class of cases (*general* hypothesis). A singular hypothesis is a claim about one specific instance or case, for example: John is a type A person or Mary is a very bright individual. General or 'universal' hypotheses make claims about classes of people, for example: people who have high levels of anxiety are more likely to resort to suicide.

This discussion is summarised in figure 19.1 on page 123.

## Elaboration: hypotheses, assumptions and postulates

It is important to realise that the 'epistemic status' (literally 'a status' that a claim has to be accepted as part of the body of science') is something that varies. Hypotheses and conjectures make claims that require substantiation and cannot therefore claim the same epistemic status as well-established

**Figure 19.1** Kinds of hypotheses




and entrenched scientific theories and models. By the same token, explanations that may thus far have been regarded as fairly plausible accounts of the world, may suddenly become suspect or at least less plausible and eventually even be rejected because of new evidence.

The discussion of hypotheses also allows us to define 'postulates' and 'assumptions' in science. Assumptions (presuppositions) and postulates (axioms) have the same epistemic status as hypotheses in that they are also 'hypothetical' or 'conjectural' statements. The critical difference though, is that researchers choose *not* to submit assumptions and postulates to empirical testing. Their truth is accepted, at least for purposes of the investigation at hand. The reasons for this differ for postulates and assumptions.

Postulates or axioms are usually accepted as statements that are *self-evidently* true. Postulates, sometimes also referred to as 'principles', of causality in physical nature, or of rationality in human behaviour, are examples. Postulates are usually general principles that are accepted as being applicable to all human behaviour and hence regarded as self-evidently true. They function as 'first principles' in a system of derived propositions.

Assumptions and presuppositions function as essential *background beliefs* that underlie other decisions in the research process. Examples would be assumptions on the nature of the population to be investigated, the most appropriate design for the investigation, or the best definition of the phenomenon. In terms of the model of science developed in part 1 of the book, one way of classifying assumptions would be in terms of the dimensions of science. This would lead to the following typology:

- Epistemological assumptions are assumptions about the nature of knowledge and science or on the content of 'truth' and related ideals.

PART 3

- Ontological assumptions include assumptions about human nature, society, the nature of history, the status of mental entities, observable and material phenomena, and causality and intentionality in human action behaviour.
- Methodological assumptions are assumptions about the nature of the research process and the most appropriate methods to be used, about the relative worth of quantitative and qualitative methods, about interpretation versus explanation, and about the ideal of universal statements versus specific and 'local' generalisations.

## Summary

In conclusion it is necessary to say something about the criterion of 'empirical testability'. A good hypothesis is clearly one that provides an interesting and plausible explanation of certain facts. A good hypothesis may be derived from either well-established theory or previous research (more validational studies), or it may develop out of first-hand observation and data collection in the social world (more exploratory studies). In the final analysis, though, a good research hypothesis must be empirically testable.

Consider the hypothesis that 'television causes violence'. People can debate this claim in various ways, but it cannot be empirically tested before having been made much more explicit, in other words, operationalised (cf. the next chapter). Presumably the statement implies that viewing certain kinds of television programmes leads to violence. But what does 'viewing' mean? Which programmes, for how long, how often, under what circumstances, how intensively, and with or without parental guidance? If we were to limit 'television programmes' to certain programmes (for example, *The A-Team* ), how do we control for the effect of other programmes such as films and news? The notion of 'violence' is equally complex. Do we limit our study to physical violence, or do we include other forms of violence such as verbal abuse? Do we only count acts of violence or are we also interested in different kinds of violence and its intensity?

These questions are posed at the end of this chapter to emphasise the close link between conceptualisation and operationalisation in research. It is precisely because of the intrinsic relationship between the connotation and denotation of concepts (what they mean and what they refer to), that conceptualisation and operationalisation are linked.

## Assignment

1. Summarise the main hypothesis of the Tan *et al.* study (reading 4).
2. Tan *et al.* clearly expected their research to show that the image of the USA, as portrayed on American television, would have been internalised and also accepted as being accurate representations of American culture by foreign audiences (in Mexico and Taiwan). Reconstruct their argument that leads them to expect this.
3. How does Hill (reading 2) relate Lerner's 'just-world' hypothesis to his research?

# 20

# *Operationalisation*

**Central theme**

Operationalisation or operational definition consists of linking the key concepts in the problem statement to the actual phenomena to be studied. This 'linkage' is usually accomplished by constructing a measuring instrument such as a questionnaire, scale, index, test or observation schedule, in which items are formulated to define all the variables in the study operationally.

**Key concepts**

Operationalisation – operational analysis – measurement validity – construct validity – criterion validity – predictive validity.

## Main argument

Operationalisation or operational definition consists of the development of a measuring instrument by means of which accurate data about specific phenomena can be obtained. Let us take the example of a fairly abstract concept in social science, namely 'alienation'. In this case, operationalisation would involve the development of a measuring instrument to collect reliable data about the phenomenon called 'alienation'. The aim of the study could vary: the researchers might need to determine the extent to which alienation may be regarded as a characteristic of a certain group of people such as marginalised street children or highly-stressed business-people. Another aim may be to determine whether an existing theory or theories provide a correct interpretation of alienation. Irrespective of the specific research aims and the unit of analysis to be chosen, or even of whether the approach will be qualitative or quantitative, the concept of 'alienation' must be rendered measurable.

But how do we 'make' a concept measureable? For example, it would obviously be quite absurd to approach individuals and to ask them whether they are alienated. Similarly, taking up a position on a street corner or in a factory and trying to observe whether people are alienated would be equally ridiculous. The obvious and most common approach would be to collect data on the theoretical concepts by means of indirect measurement. This would involve compiling a list of questions or items that are assumed to be elements of the phenomenon called 'alienation' and presenting them to a sample of individuals in an interview situation. If, for instance one were to

administer twenty items that deal with aspects of alienation (without at any stage mentioning the concept of 'alienation' by name), it ought to be possible to gain an overall impression of the person's position with regard to the phenomenon. The process of operationalisation involves compiling, for purposes of measurement, a list of characteristics denoted by the concept. When a measuring instrument is constructed the items or questions are regarded as indicators of the list of denoted characteristics.

The most commonly used indirect measurement technique in the quantitative tradition is scale construction. Dean's (1961) social alienation scale, which is based on Seeman's typology, can be used to illustrate what the process of operationalisation involves.

### Example: Dean's social alienation scale

Dean regarded three of Seeman's dimensions as most typical of the construct 'alienation'. These were powerlessness, normlessness and what he referred to as social isolation. He subsequently formulated a number of questions relating to each of these dimensions which he believed would, in combination, define the dimension more clearly. The item format was such that each item had to be rated on a five-point scale, namely strongly agree, agree, uncertain, disagree, and strongly disagree.

Item scores ranged between 4 (strongly agree) and 0 (strongly disagree). Five of the items were negatively worded, necessitating a reversal of the scoring pattern. Subscale scores were used to determine an individual's level of powerlessness, normlessness and social isolation, while a total scale score was used to determine his or her overall level of alienation. According to the scheme used, a score of 96 (24*4) would indicate a maximum level of alienation, with 48 representing a neutral score. For illustrative purposes, a few items from each subscale are reproduced here:

*Social isolation*

1. "Sometimes I feel all alone in the world".
2. "Real friends are as easy to find as ever".
3. "There are few dependable ties between people any more".
4. "People are just naturally friendly and helpful".

*Powerlessness*

5. "I worry about the future facing today's children".
6. "There are so many decisions that have to be made today that sometimes I could just blow up".
7. "There is little chance for promotion on the job unless a man gets a break".
8. "We are just so many cogs in the machinery of life".

*Normlessness*

9. "People's ideas change so much that I wonder if we'11 ever have anything to depend on".
10. "Everything is relative, and there just aren't any definite rules to live by".
11. "With so many religions abroad, one doesn't really know which one to believe".

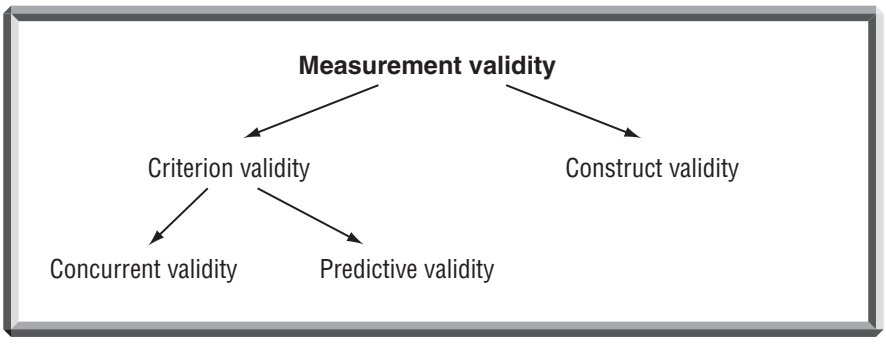
The content and nature of the measuring instrument is determined by a range of factors including formulation of the problem, the methodological preferences of the researcher and the nature of the phenomenon. If the phenomenon of alienation were to be studied amongst a smaller group of people the researcher would be likely to employ qualitative methods such as in-depth interviews and participant observation. Manifestations of alienation as they occur in literature or in the media such as newspapers or letters in newspapers, could be investigated by means of one of the forms of content analysis. Studies of a more quantitative nature on alienation would probably be conducted by means of some form of interview schedule or questionnaire.

The central concepts in an investigation must be operationalised, regardless of the data collection technique that is envisaged. The above example sets out the nature of such operationalisation in a quantitative study. However, even in a qualitative study where, for example, we are interested in investigating the degree of alienation evinced by a group of people displaying pathological behaviour such as rapism, the investigators would need to have a clear grasp of the denotative dimensions of alienation. Without such clarity they would be unable to identify the manifestations of alienation correctly in the unstructured interviews and would hence be unable to collect reliable data on the phenomenon. Similarly, in content analysis the researcher must develop a category system in which the central denotative components of the concept of alienation have been accounted for, before being able to analyse newspaper reports or letters to newspapers.

## Elaboration: measurement validity

Important questions at this stage are clearly: when are the operationalisations of concepts or constructs valid? When does an operationalisation comply with the requirement of measurement validity. In the field of measurement theory it has become customary to distinguish amongst several types of measurement validity. These are presented schematically in figure 20.1.

**Figure 20.1** Types of measurement validity




Since there are numerous introductory texts in the field of measurement theory, we shall describe each concept only briefly.

PART 3

## Criterion validity

According to Nunnally (1978:87) criterion validity is relevant 'when the purpose is to use an instrument to estimate some important form of behaviour that is external to the measuring instrument itself, the latter being referred to as the criterion'. An example from everyday life is when we use the number of distinctions attained by matriculants as a predictor of academic achievement at university. If a high positive correlation were to be found between the number of distinctions and tertiary academic achievement, the former could justifiably be regarded as a good predictor of the latter.

This is an example of predictive validity, which is the criterion employed to determine whether the measurement can be used to predict a future situation validly. If, in the example of alienation, it were possible to develop criteria of the manifestations of alienation, it ought to be possible to predict future manifestations by means of an alienation scale.

When the criterion and the other measurements are used simultaneously this is referred to as concurrent validity. The following is an example of concurrent validity: if scores on an intelligence test and examination scores were to be simultaneously obtained and found to be highly correlated, the intelligence test could justifiably be regarded as a valid indicator of the examination marks.

## Construct validity

Obtaining construct validity is probably one of the most difficult problems in social sciences research. Earlier in this section we referred to the fact that the social sciences are characterised by highly theoretical concepts or constructs that are derived from scientific theories and cannot be inductively inferred from the observation of human behaviour. The methodological problem that arises is the following: how does the researcher really know that the items included in the scale or questionnaire actually measure the construct that they are supposed to represent?

How for instance can Dean be sure that the 24 items actually measure 'social isolation', 'normlessness', and 'powerlessness'? A few examples will serve to illustrate the complexity of the issue. Item 10 ("Everything is relative and there just aren't any definite rules to live by") and item 11 ("With so many religions abroad, one doesn't really know which to believe") might well also measure something akin to 'relativism'. For argument's sake item 7 ("There is little chance for promotion on the job unless a man gets a break") could be regarded as a measurement of 'fatalism'. From the above it follows that construct validity refers to the extent to which a scale, index or list of items measures the relevant construct and not something else.

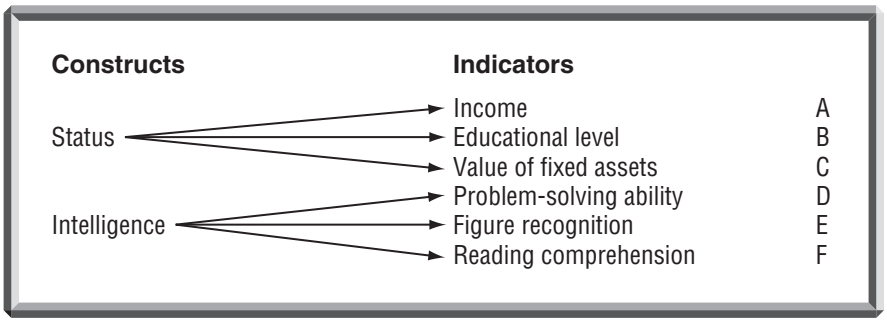
Cook and Campbell mention three threats to construct validity. "Inadequate preoperational explication of constructs, mono-operation bias and mono-method bias" (1979:64–66). Under the first heading Cook and Campbell discuss the effect of poor conceptualisation on construct validity: "A precise explication of constructs is vital for high construct validity since it permits tailoring the manipulations and measures to whichever defini-

tions emerge from the explication" (1979:65). This issue was addressed in the section on conceptualisation. The second and third threats to construct validity are related: mono-operation bias refers to problems that surface when single indicators or measurements of a construct are employed, while mono-method bias refers to problems resulting from the use of the same type of measurement technique for collecting data on the construct that is being investigated. In view of the fact that mono-method bias is discussed in the next section, we shall limit ourselves to a few remarks on the issue at this stage. Cook and Campbell define this concept as follows: "Since single operations both underrepresent constructs and contain irrelevancies, construct validity will be lower in single exemplar research than in research where each construct is multiply operationalised in order to triangulate on the referent" (1979:65).

With reference to our example of alienation, it ought to be clear that, had Dean used only one item to obtain a scale score, mono-operation bias would have occurred. Although it has become customary to employ multiple-item scales for each construct, there is no denying that far too many attitudinal measurements still rely on single items to measure the respondent's attitudes to a variety of issues. However, when multiple indicators (or what is known as multiple operationism) are used, various techniques can be used to help determine the construct validity of theoretical concepts. One such technique is factor analysis. The following example has been slightly adapted from Krausz and Miller (1974:24–25). The example is a simple illustration of the principle underlying the use of factor analysis to determine construct validity.

Assume that the theory that we are employing contains the constructs 'status' and 'intelligence'. Assume also that six indicators are used to measure these constructs, namely income, educational level, value of fixed assets, problem-solving ability, figure recognition and reading comprehension. This could be represented as in figure 20.2.

**Figure 20.2** The use of factor analysis in determining construct validity




Basically, factor analysis involves an analysis of the intercorrelations between indicators. In the present example, one would expect high intercorrelations between A, B and C, and also between D, E and F. We would also expect very low or zero correlations between the indicators of status (ABC) and intelligence (DEF). Were this pattern of correlations to be

found, it would suggest the existence of a common factor underlying A, B and C, and a second factor underlying D, E and F. It is important to note that the application of the factor analysis technique is limited to the identification of factors on the basis of the intercorrelations between indicators. The researcher still has to demonstrate the relationship between factor I (ABC) and factor II (DEF), and the underlying theory. It should be clear that 'demonstrating the relationship' is a matter of interpretation, and that alternative interpretations could exist. Referring once again to the example of alienation, one would expect Dean to have found high intercorrelations between items 1 to 9 (social isolation), 10 to 18 (powerlessness), and 19 to 24 (normlessness). He would, however, have expected low correlations between the items that measure social isolation, normlessness and powerlessness respectively.

Thus far we have limited our discussion to the problems surrounding operationalisation in quantitative studies. Obviously operationalisation, in the more technical sense as we have used it thus far, cannot be used in qualitative studies. Nonetheless, the methodological problems concerning the relationship between theory (constructs) and measurement or observation are similar, although the specific problems differ.

One of the major distinguishing characteristics of qualitative research is the fact that the researcher attempts to understand people in terms of their own definition of their world. In terms of Becker's distinction, the focus is on an 'insider perspective' rather than on an 'outsider perspective'. In qualitative research the natural and subjective components of the sample are emphasised. It is for this reason that qualitative research is also referred to as naturalistic research. From a naturalistic perspective, one of the major assignments in research of this nature is accurate identification of the 'native' or 'indigenous' concepts or conceptualisations of the subjects being investigated. It is only after having dispensed with this task that the researcher will attempt to integrate them within the framework of an existing social scientific theory or model. A leading qualitative researcher, Norman Denzin, defines 'operationalisation' in qualitative research as follows:

> *Naturalists link their theoretical components to the empirical world through the collection of behaviour specimens. They operationalise those concepts through a careful analysis of their specimens. Starting with loose sensitising definitions of their concepts, they empirically operationalise the concepts only after having entered the worlds of interaction that they wish to understand … They include as many behaviours as possible as indications of the concept in question, through the use of naturalistic indicators which represent any segment of the subjects: behaviour that reflects one, or describes, a sociological concept. An indicator is naturalistic if it derives (preferably spontaneously) from the subjects: world of meaning, action, and discourse – it is not imposed on that world by the observer* (1978:103).

Typically, the concepts generated in qualitative research are concrete concepts, which accurately reflect the world of the subjects. Qualitative researchers quite justifiably claim that qualitative concepts have strong construct validity because they have their roots in the world of the subjects. An

obvious limiting factor with concepts of this nature is their limited interpretative scope. For the precise reason that these concepts are part of the world of meaning of a given group their generalisability will usually be limited.

## Summary

This concludes our discussion on the aspects of validity that are relevant to conceptualisation and operationalisation. We have distinguished between theoretical validity (connotative validity) and measurement validity (denotative validity) on the basis of the distinction between the connotative and denotative dimensions of concepts. Despite the distinctions, we have emphasised the close relationship between these two types of validity throughout our discussion. On the one hand, theoretically sound concepts have only limited value if they do not pave the way to good empirical research. On the other, valid measurement presupposes adequate conceptual explication. Even if one assumes that, at this point, the researchers have dealt with the most important threats to theoretical and measurement validity by means of systematic research design and competent planning, they obviously have still to contend with the unusual demands related to data collection in the social sciences. This is the topic of the next chapter.

## Critical assignment

1. After studying reading 4, list the key independent and dependent variables of the study. Then indicate how Tan *et al.* have defined these variables operationally.
2. What are the key concepts in Giorgi's study (reading 1) and how have they been operationalised?

# 21

# *Sampling*

**Central theme**

'Sampling' is a familiar notion. In everyday life we talk of sampling when we refer to the process of selecting things or objects when it is impossible to have knowledge of a larger collection of these objects. In social research, sampling refers to (probability) sampling procedures which involve some form of random selection of elements from a target population. The aim of sampling in social research is to produce representative selections of population elements.

**Key concepts**

Nomothetic and ideographic studies – generalising and contextualising research strategies – the logic of sampling – population – target population – stratum – sampling frame – census – sample – representativeness – bias –chance – random selection – sample size.

## The main argument

Sampling is part of our everyday life. We sample restaurants by selecting different ones over a period of time; we decide which car to buy on the basis of a sample or selection of our own and other people's experiences. We continually gather information from specific instances and generalise to new ones on the basis of their belonging to a common population of instances.

In everyday life, 'sampling' is pretty much equivalent to 'selection'. Although we often work on the assumption that sampling in everyday life is reliable, that is, that it *represents* the 'population' from which it is selected, this is often not the case. Sampling in everyday life is usually haphazard and unsystematic and hence often results in decisions being based on inaccurate information.

The concept of 'representative' sampling is a well-known one. We know that we cannot really judge all politicians by their appearance on television programmes, although we are tempted to do so, and that all Italians are not the types depicted in Mafia movies. This is precisely the stuff that stereotypes are made of. Scientific sampling aims to avoid the pitfalls of biased and unsystematic sampling. Before embarking on a more detailed discussion of the concept and logic of sampling, it must be emphasised that not all social research involves sampling. We must first distinguish between two distinctive research strategies in social research.

## Contextual versus generalising research strategies

Since 1984 when Wilhelm Windelband proposed the distinction between *nomothetic* and *ideographic* research strategies, it has become customary to classify social research into one of these categories. The best description of this distinction is found in the following statement:

> *In their quest for knowledge of reality, the empirical sciences either seek the general in the form of the law of nature or the particular in the form of the historically defined structure. On the one hand, they are concerned with the form which invariably remains constant. On the other hand, they are concerned with the unique, immanently defined content of the real event … scientific thought is nomothetic in the former case and ideographic in the latter case* (Windelband, 1980:175).

In terms of this distinction, two general types of research strategies can be identified. On the one hand, there are broad strategies by means of which it would be possible to search for general regularities in human behaviour (the word 'law' is perhaps too strong a term to use). On the other, the attention is focussed on a single event or case and its structural coherence.

In a previous book (Mouton and Marais, 1985), I suggested the use of the terms 'general strategy' and 'contextual strategy' to refer to these two broad types of research. In a *general* or *generalising* strategy, social objects or phenomena are studied for their interest as representative examples of a larger population of similar objects or phenomena. In a *contextual* strategy we study phenomena because of their intrinsic and immediate contextual significance.

Typical examples of studies with a contextual strategy are encountered in the historical disciplines (where the focus is on a specific event), the 'cultural' or 'hermeneutic' disciplines like languages, arts, jurisprudence and theology, and studies in social science where the aim is to investigate a single case (or a limited number of cases) in an in-depth manner. Well-known examples of in-depth investigations are Bogdan's study of a single transsexual (Jane Fry), Whyte's study of a specific subculture (The Street Corner Society) and, obviously, the multitude of ethnographic studies of specific cultures, communities and tribes. In all these examples, the primary aim of the investigators is to produce an extensive ('thick' – Geertz's term) description of the phenomenon in its specific context.

In contrast, the aim of research is often to study a representative number of events or people with a view to generalising the results of the study to a defined population or universe. Typical examples are experimental studies, comparative studies and various kinds of sample surveys.

It is important to emphasise that there is no logical or philosophical reason why any one of these strategies should be regarded as being in any way superior to another. They are all legitimate forms of inquiry. In the final instance, it is the researcher who decides – primarily in terms of the specific objectives of her study – on the most appropriate strategy.

Finally, a note on terminology. In contextual studies, it is customary to refer to the 'selection' of cases (for example, individuals, an event, a text or an organisation) that are included in the investigation. It is only in general-

PART 3

ising studies that we would use the term 'sampling' when referring to the procedures involved in selecting cases.

## Basic concepts: population, census, target population, sample and sampling frame

The terms 'population' and 'universe' are used interchangeably in the literature. We begin by looking at three definitions:

- A 'population' is 'a collection of objects, events or individuals having some common characteristic that the researcher is interested in studying' (Roscoe, 155).
- The 'universe' is the 'complete set of elements and their characteristics about which a conclusion is to be drawn on the basis of a sample' (Mueller, 364ff).
- The 'population' is 'the aggregate of all the cases that conform to some designated set of specifications' (Selttiz and Cook).

All three of these definitions emphasise the fact that the population is a collection or set of elements referred to as the 'population elements', which meet a certain definition or specification. This implies that populations in the context of sampling are always 'constructed' or 'defined' sets of elements. They are not naturally given entities. For this reason, the 'population' that interests a researcher has nothing to do with the everyday notion of the population of people in a certain country or city. The social researcher might of course be interested in studying the attitudes of the total population of a country, but this would be an example where the statistical notion of 'population' and the demographic notion coincide.

Another implication of the way in which 'population' is defined, is that it refers to a set of elements of various kinds. In fact, we can apply it to all of the seven categories of 'units of analysis' that were distinguished in chapter 9. In social research populations may hence include:

- populations of *individual human beings* such as adults, school children, the aged in a certain area, the inmates of a prison or all the members of a sports team;
- populations of *organisations* such as all the financial institutions in a country or all the government departments;
- populations of *institutions* for instance all the tertiary institutions in South Africa – the universities and technikons;
- populations of *collectives* for instance all cities with populations exceeding 50 000, or all developing countries;
- populations of *social activities or events,* for example: all instances of violence such as murder, armed robbery or rape within a certain time frame;
- populations of *cultural objects* such as the set of Agenda programmes televised in 1994 or the collected works of Sigmund Freud; and
- populations of *interventions* such as all the training programmes in RDP offices in Gauteng or all the affirmative action programmes in banks in South Africa.

To re-emphasise: in social research the terms 'population' and 'universe' are 'defined' or 'constructed' entities within the context of a specific research project. These are not 'naturally givens'. In terms of our discussion in chapter 9, a *population* is the sum total of all the cases that meet our definition of the unit of analysis. Thus, if we say that we wish to study 'adolescents between the ages of twelve and eighteen who live in Cape Town' as a unit of analysis, the population of our study will be the aggregate or sum total of all the cases or instances (in this case 'individual human beings') that fall within this definition.

A *census* is a count of all the elements in a population and/or a determination of the distributions of their characteristics, based upon information obtained on each of the elements. For various reasons, though, we usually select only some of the elements with the intention of finding out something about the total population from which they are taken. We refer to that selection of elements as a *sample.*

Selltiz and Cook maintain that, under certain specifications, one population may be included in another. The population of 'students at the University of Stellenbosch' would hence include other 'subpopulations' or 'population strata' such as 'female students at US' or 'male students at US'. Obviously various features could be used to define the almost unlimited number of *strata,* such as gender, age, height, weight, degree course, place of residence, race and political affiliation.

Defining the population is a two-step process: first, the *target population,* which is the population to which one wishes to generalise, must be identified and second, the *sampling frame* must be constructed. When defining the target population there are two important considerations, namely the scope of the generalisation planned and the practical requirements of drawing the sample.

Once the target population has been defined, it must be made operational through the construction of the sampling frame. The sampling frame refers to the set of all cases from which the sample will actually be selected. It is important to note that the sampling frame is *not* a sample, it is the *operational definition of the population* that provides the *basis* for sampling.

Let us return to an everyday example. Suppose you wish to study the level of service quality of the better hotels in the Western Cape. Your target population, the set of 'elements' to which you wish to generalise, is all the 'top hotels' (for example, all hotels that are operationally defined as two-star and higher) in the municipal districts of Cape Town, Bellville, Somerset West and Stellenbosch. The sampling frame is the *actual* collection of hotels from which you will sample.

There are basically two ways of constructing a sampling frame, namely by drawing up a complete list of all the cases that fit one's definition or by defining a rule that will define membership. For example, in a city telephone survey, the sampling frame could consist of the telephone directory for the specific city (a listing), or the set of all telephone numbers with certain telephone exchanges (a rule).

In our case, it should be possible, by working systematically through telephone directories, calling tourist information centres or, even better, by procuring a list of all two- to five-star hotels from the Federation of

Associated Hospitalities in South Africa (FEDHASA), to compile a fairly comprehensive sampling frame.

A researcher will obviously try to compile a sampling frame that is identical to the target population. Unfortunately this is usually only possible for small, geographically concentrated populations such as organisations or university campuses. Because it is often impossible or impractical for a researcher to compile an accurate list of the target population, existing lists have to be used and these are often incomplete and outdated.

Strictly speaking, conclusions should be made only about the population represented by the sampling frame. Yet, it is to the target population that we wish to generalise. Therefore one should always evaluate cases in the target population that have been omitted from the sampling frame.

## The logic of sampling

The key concept in sampling is *representativeness.* Unless the sample from which we will generalise 'truthfully' or 'faithfully' represents the population from which it was drawn, we have no reason to believe that the population has the same properties as those of the sample.

The concept of 'representativeness' can be better explained by relating it to the principles of statistical inference, namely inference from samples to populations. Wright formulates it as follows:

> *To decide whether we may soundly infer that the population has a property that we have observed in our sample, we must ask the following question: 'What is the best explanation of the sample's having that property?'* (1982:121).

Logically there are two possible explanations: either the sample has property P because the population has that property (E1), or the sample has P, but *not* because the population has that property (E2).

There are, furthermore, two versions of E2.

E2a: The sample may have property P, not because the population has it, but rather because of some *distorting* feature in the selection procedure.

E2b: The sample has property P by *chance.*

It is important to realise that E1 must compete with both versions of E2, because both versions characterise a sample as an unrepresentative and hence unreliable guide to its population.

We return to our example of the study of top hotels in the Western Cape. We have thus far completed two steps:

Step 1: We defined the target population (hotels two stars and higher in certain magisterial districts in the Western Cape).

Step 2: We defined the sampling frame (all such hotels as listed in the most recent directory of FEDHASA). Assume that this yielded a list of 200 hotels.

The third step is the actual sampling.

Step 3: Draw a sample of twenty hotels by choosing the first twenty names on the list provided by FEDHASA.
Suppose we proceed with the study, collect and analyse the data, rank our twenty hotels in terms of a five-point-service quality scale and find that the service at all twenty hotels is rated as *extremely* poor. This raises the question: how do we explain the fact that all twenty hotels (our sample elements) have the property ('extremely poor service quality')? The above discussion suggests three possible explanations:

E1: The sample might have turned out that way *because* all the hotels in the Western Cape *do* in fact offer service of poor quality.

E2a: However, our sample findings might be inaccurate and most of the hotels in the Western Cape might actually deliver service of high quality. The inaccurate results might be due to an error in the sampling procedure, probably because the twenty hotels selected were simply the first twenty on the list. Had I investigated more thoroughly I might have discovered that FEDHASA lists the hotels from the lowest ratings (two star) to the highest (five star). This would explain why the first twenty names drawn were all low-rated hotels!

E2b: But suppose I sampled differently. Say I followed a more scientific procedure by sampling every tenth name on the list (systematic sampling) or by using a table of randomly generated numbers (and the hotels were numbered) and still came up with the same results (all the hotels sampled deliver poor service quality). We would then have no choice but to attribute this outcome to the luck (or bad luck) of the draw, to chance. It seems very unlikely that, after having taken appropriate measures to ensure a 'random' selection procedure, you could still come up with an unrepresentative sample, but it does sometimes happen! In this case, we just happened to draw randomly, from the list of two hundred, the twenty hotels with the lowest levels of service. This is an example of an explanation for the argument in E2b, which claims that all or the majority of the hotels are providing poor service because this is the case in the population, which is wrong, not because of *poor reasoning* (the evidence is based on objective procedures and I am therefore quite justified in concluding E2b). So the difference between the last two versions is simple: E2a is the result of a biased selection procedure (which led to a sample error); E2b is due to chance (or bad luck if you wish). This distinction allows us to define the notion of an unbiased sample in research:

> *An unbiased sample is one in which no unrepresentativeness can be traced to the selection procedure (all explanations from our category E2a have been ruled out as implausible)* (Wright, 1982:126).

If a selection procedure *is* responsible for unrepresentativeness in the sample, the sample is biased by the selection procedure. The most celebrated case of a biased selection is the 1936 presidential election poll in the USA conducted by the *Literary Digest.* The *Digest* randomly selected names from telephone directories throughout the country, called the selected individuals, and compiled the results. On the basis of their sample they predicted a

landslide win for Alf Landon, the Republican nominee. But it was Landon's opponent, Franklin Roosevelt, who won by a landslide. The unrepresentativeness of the *Digest's* sample is easily traceable to the selection procedures, for in 1936 the vast majority of the nation's poor and lower-middle class voters could not afford telephones. So by limiting its sample to voters listed in telephone directories, the *Literary Digest* inadvertently biased its sample heavily in favour of relatively affluent citizens. In 1936, even more than today, the relatively affluent citizens tended to be Republicans.

In South Africa a comparable situation would arise if one were to use the telephone directory as a sampling frame for a national sample. The majority of South Africans, especially those in the rural areas, would then be excluded.

It is important to note that a given selection may be unbiased for one property but not for another. In our hypothetical example of the hotel study, we showed how the relevant property, namely service quality levels, was systematically linked to the selection procedure and that this produced a biased sample. But say for instance I was interested in other properties of hotels in the Western Cape, for example, staff composition in terms of race and gender distribution, or the average number of rooms. It is highly unlikely that these properties would be related to the quality rating of the hotel. If this assumption is justified (although the cautious researcher might wish to test it!), then the selection procedure initially used (taking the first twenty names on the list) would probably not have led to a biased sample.

In summary: selection procedures will naturally be connected with some properties and not with others, so a selection procedure that is quite adequate for inferences about one property may well be inadequate for others. This illustrates a general point: the more we know about populations and the connections among their properties, the better. In fact, this example shows why it is essential (where possible) to use probability sampling designs. It is precisely because we do *not* usually have sufficient information about the population that we should choose a sampling procedure based on random selection. This brings us to the relationship between *bias* and *randomness.*

By their very nature, random samples are unbiased, but they are a particular sort of unbiased sample: not all unbiased samples qualify. Statisticians define *random sampling* as a procedure in which every member of the population has an equal chance of being selected. Giving every member an equal opportunity of being included in the sample implies that, not only should there be no connection between the selection procedure and P (as in the *Digest* example where non-telephone owners had no chance of being included in the sample) but also that there must be no connection between the procedure and any statistical property of the sample, (as was the case in our first attempt at selecting twenty hotels).

According to Wright, a procedure is *effectively random* when there is no explanatory connection between the procedure and any statistical property of the sample that is likely to correlate with P. Drawing names from a hat will be effectively random in this sense, although certain properties of the paper slips on which the names are written, such as size, shape, thickness,

weight or edge condition may well affect the selection. But since there is not likely to be any connection between these properties and the names themselves, the selection is 'random enough' for most purposes.

> *So the value of a random, or effectively random, sample is that it is often our only route to unbiasedness; and this is increasingly the case the less we know about the property in question* (Wright, 1982).

The discussion thus far has dealt with the problem of unrepresentative samples where the bias is a result or outcome of the selection procedure. The problem of chance or 'bad luck' must also be addressed. As Wright aptly comments: "We might do all the right things, get a complete list of the population, use a table of random numbers, employ redundant safeguards and nevertheless end up with all fat ones or all Democrats … purely by chance" (1982:129).

One response is to increase the size of the sample. It is generally true that as the size of the sample increases, it becomes less likely that we will obtain inaccurate results purely by chance. Consider again our hotel example. If it is in fact so that there are only twenty poor quality hotels in the Western Cape and we were unlucky to draw these twenty in our sample by using systematic or random sampling, then by increasing the sample to forty, we will already have twenty high-quality hotels in the sample. If we increase the sample size to eighty, (with sixty high-quality and twenty poor-quality hotels), we are increasingly getting closer to the actual value of the property in the population. But we are usually unable to follow this procedure in concrete research. The point about sampling is precisely that it is usually *neither feasible nor possible* to draw large samples. We sample precisely because we wish to base estimates of population properties on small selections of cases.

This finally brings us to the notion of *inferential statistics.* Statisticians have devised ways of obtaining more accurate estimates of population properties, or in other words, of drawing inferences about populations on the basis of sample information. They have developed procedures that enable us to be more precise about the odds of getting accurate estimates. The question that interests us is the following: as the sample increases how much more confident are we that the hotels have a certain property? Where the sample was still very small, we could obviously not be very sure that the proportion of good-quality hotels in the population was close to that which we found in our sample – pure chance is still too strong a possibility. As the size of the sample increases, so also can our confidence that the proportion of good-quality hotels in the sample mirrors that of the population. We decide when to stop increasing sample size for the same sort of reasons that we decide to stop collecting data in any empirical investigation, which is once we have enough certainty for the purpose at hand or when the cost of collecting further data exceeds the likely benefit in increased certainty.

In summary we can say that probability sampling has two major advantages: it removes the possibility that bias on the part of the investigator will enter into the selection of cases; and, through the process of random selection, the principles of probability theory may be applied to estimate the accuracy of samples.

The first point has now been discussed in some detail. Regarding the second, some concluding comments can be based on the hotel example. Assume that the true proportion of excellent-quality hotels in the Western Cape is eighty per cent. Since we do not know what the value of this population property (referred to as the population *parameter)* is, we must use the results of our sample study to estimate it. Suppose we disregard the highly unlikely result of drawing only the poor quality hotels through a process of random selection, and assume that we obtain a result where sixty per cent of the hotels in our sample are rated excellent. In this case, the difference between the sample statistic (sixty per cent) and the population parameter (eighty per cent), is defined as the *sampling error.* The 'average' of such errors for an entire sampling distribution is known as the *standard error.* This means that if we were to draw all possible samples of size twenty from the total population, the average deviation of each sample statistic from the true population value is the standard error. The concept of 'standard error' is useful for formulating a general rule about sample size: the larger the sample size, the smaller the standard error.

We remarked earlier that probability theory enables us to make statements about the accuracy of a sample statistic in actual research. According to this theory, the distributions of various sample statistics (such as proportion or mean) exhibit a consistent and predictable pattern. So, although the population parameter is not known, the theory indicates *how* sample estimates will be distributed and provides a statistical formula for calculating the standard error – a measure of how much the sample estimate is likely to vary. However, the technical treatment of estimating population parameters using the information obtained through a study of a sample, is beyond the scope of this book. Any good textbook on statistical inference (for instance Krathwohl), can be consulted.

## Assignment

You have to design a study to investigate differences in the political attitudes of South African university students. As an exercise, address the following issues:

- Define the target population.
- How will you define the sampling frame?
- Which variables are most likely to be used to stratify your sample?
- What are the likely sources of error that might affect the selection procedure?

# 22

# *Data collection (data sources, reactivity and control)*

**Central theme**

The fact that human beings are the 'objects' of inquiry in social research creates problems that are not encountered in the physical sciences. Human beings normally react to the fact that they are being studied and investigated. Reactivity is a function of the kind of data source used and of the measures of control that the researcher uses.

**Key concepts**

Data sources – physical traces – archival sources – unobtrusive measures – reactivity – experimental and statistical control.

## Main argument

One of the distinctive features of the social sciences is that, to a greater of lesser degree, the participants in social research, to wit, individuals or groups, are aware of the fact that they are 'objects' of investigation. Depending on the nature of the particular data source and the manner in which it is collected, human beings are aware of this situation when they participate in research and they tend to react to it. In the literature on methodology, this phenomenon has been known as *reactivity* since 1957 (Campbell, 1957). In this section this term will be applied in a broad sense to refer to the phenomenon that human beings react to the fact that they are participants in research. This reaction manifests itself in a variety of forms, for example, resistance to being interviewed or to completing questionnaires, supplying inaccurate information as a result of apathy, wilfulness, modifying behaviour or information to create a better impression, or deliberately misinforming the researcher. The different manifestations of human reactivity in the process of data collection will be discussed in the next section. However, it is important to note that, depending on the nature of the data source, reactivity is an important variable.

In accordance with Manheim's (1977) scheme, data sources in the social sciences can be divided into two main categories, with two subcategories in each, namely:

PART

3

- Human behaviour and human characteristics.
- Products of human behaviour and of human characteristics.

## Human behaviour and human characteristics

Mannheim distinguishes between two main categories: on the one hand, verbal behaviour, which includes verbal or written responses to questions posed by the researcher and on the other, all observable behaviour and characteristics. The first category includes all forms of human behaviour which only become accessible by means of indirect observation such as questionnaires, interviews or projective tests. The second category includes all forms of individual behaviour, social interaction, and observable characteristics such as gender, number of individuals, physical locality, non-verbal behaviour and stature. Direct observation methods are generally used to collect data in this category. Examples would include structured or controlled observation in experimental situations, and participant observation in non-structured situations. The distinction drawn between structured and unstructured observation is clearly not equally applicable in all situations (see also Groenewald, 1986). Nonetheless, it provides a rough systematisation of data-collection techniques, which is useful for the remainder of the discussion.

## Products of both human behaviour and human characteristics

Mannheim divides this category into two subcategories, namely physical traces and archival sources. Physical traces are defined as any physical evidence that has been left from earlier human behaviour. In accordance with Webb's subsequent refinement of this category, physical traces are further subdivided into erosion measures and accretion measures. Examples of erosion measures would include wear on floor tiles at museum exhibits, erosion of library books and patterns of attire such as shoes, which may be employed as indications of human activity. Examples of accretion measures would include for example, the number of empty liquor bottles per week in refuse cans, the placing of buildings and pot shards.

Archival or documentary sources refer to the extensive collections of records, documents, library collections or mass media material that have been amassed. Those sources would also include well-known material such as census data, life statistics, ecological and demographic data, personal documents like diaries, autobiographies and letters, and case studies. Other types of archival sources include mass media material like newspaper reports, the content of radio and television programmes, and film material. Webb *et al.* (1966) also refer to less well-known material such as inscriptions on tombstones, sales records, suicide notes, nursing records on patients, and voting records.

Webb and Banks (1966) were the first researchers to focus on the existence of 'differential reactivity'. Data sources where human beings are directly involved (category 1) are regarded as highly reactive sources, whereas those where human beings are only indirectly involved (category 2) are far less likely to be regarded as reactive sources.

Reactivity becomes the largest single threat to the validity of research findings when human behaviour or characteristics are the sources of data or information. With the exception of covert observation, and irrespective of whether data is collected by means of indirect or direct observation, human respondents or research participants are aware of the researcher and usually react to this situation in some or other way. Obviously the products of human activities such as documents or texts cannot react to the fact that they are being researched. It should nevertheless be borne in mind that the products of human behaviour are the result of decisions and cognitive processes. These products are the sedimentations or 'residues' of the human spirit (in Hegel's terminology). An example is manifested in the fact that when studying a text, the researcher has to be mindful of the original intention or aim of the author and of the researcher's own historicity (specific location in time and history). The fact that human beings are rational beings is obviously also manifested in the products of human behaviour. Although data sources in the second category, where human involvement is only indirect, are unlikely to display reactivity to any marked degree, the possibility cannot be ignored. In the remainder of this section we shall discuss the threats to the validity of findings in which human beings are directly involved.

How do researchers respond to the high level of reactivity of some data sources? Typically they resort to some form of 'control'. The researcher could for instance attempt to reduce the effect of error by imposing a greater degree of structure on the observations, or by exerting more control on the research situation.

Traditionally, the strongest form of control has been experimental research design. *Randomisation* is one such form of control. It involves the assignment of research subjects or participants to experimental and control groups on a random basis to control for the possible effects of individual differences. As Krathwohl aptly points out, 'random assignment makes groups comparable in all of the variables we think might present *problems and also in all other things we had not expected*' (1993:450).

Unfortunately, it is also true that such measures of experimental control are intrusive. Quite frequently, the participants of such research are isolated in a laboratory situation that is removed from their natural environment so as to limit the effects of external nuisance or confounding variables. Banks focussed on the interesting phenomenon that these control measures vary positively with the degree of reactivity of the specific observation technique employed. This means that the greater the number of controls the researcher builds into the research situation, the more likely the participants are to be reactive. Because laboratory conditions such as isolation and random assignment to treatments do not typically form part of the everyday life of the subjects, it is likely to result in artificial and atypical patterns of behaviour.

As Groenewald (1986) quite justifiably states, this presents a dilemma for the researcher. While, on the one hand, it is desirable to use observation techniques that elicit as little reactivity as possible in order to ensure the highest level of validity it is, on the other, equally desirable to employ observation techniques that make it possible to exercise as much control as possible.

Data-collection sources in which direct observation methods like systematic and participant observation, or indirect observation methods like questionnaires and interviews are used, can be controlled by the use of appropriate statistical techniques. We have, however, already indicated that these data sources are also highly reactive.

The second main category of data sources, namely physical and archival sources, does not really allow for any 'strong' measures of control. In a certain sense, the data is already given. The researcher can of course select which data sources to use. He may also be able to sample such sources (for example, newspaper reports or issues of magazines) in a content analysis study. But he has no direct control over the 'production' of the data. By definition, documentary and archival sources have already been produced. What is important is that the researcher should take steps to ensure the authenticity of such sources. Although physical and archival sources do not allow for much control, the good news is that these data categories are low on reactivity and for this reason do not pose as big a threat to the eventual validity of the findings.

The fact that reactivity and control are positively correlated (the higher the control the higher the reactivity), illustrates a point which we made earlier in this book, namely that methodology in general, and research design in particular, inevitably involve compromises. The researcher must constantly weigh the advantages and disadvantages of a number of issues against each other, and eventually decide on whatever measures are, as a whole, likely to increase the validity of his findings most.

## The requirement of reliability

The key validity criterion for data collection is 'reliability'. This is the requirement that the application of a valid measuring instrument to different groups under different sets of circumstances should lead to the same observations. Smith defines reliability by posing the following question:

> *Will the same methods used by different researchers and/or at different times produce the same results?* (1975:58).

As suggested by this definition, reliability demands *consistency* over time. In this sense, reliability refers to the fact that different research participants being tested by the same instrument at different times should respond identically to the instrument.

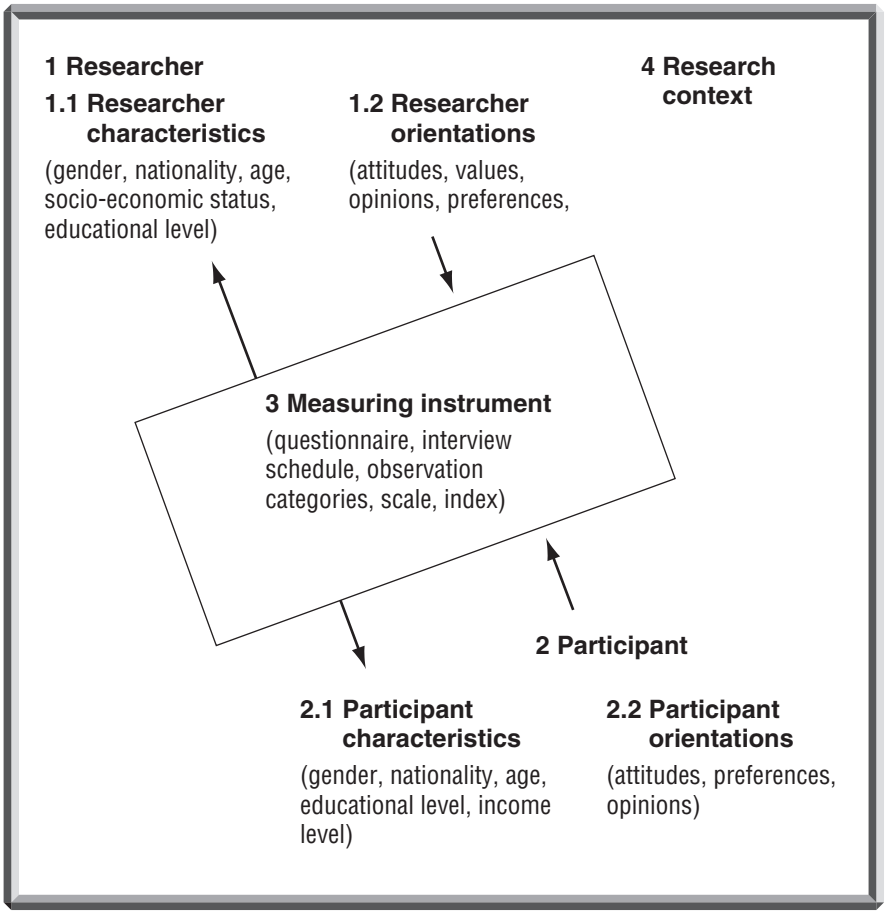
But what are the possible sources of error during data collection? I shall argue (in more detail in the next chapter) that the reliability of data is affected by the following:

- the researchers, 'experimenters', 'interviewers' or 'observers';
- the individuals or 'subjects' who participate in the research project;
- the measuring instruments such as questionnaires, scales, tests, interviewing schedules and observation schedules; and
- the research context or the circumstances under which the research is conducted.

Since we have already discussed the issue of 'measurement validity' in chapter 20, our discussion here and in the next chapter will be confined to the effects of the *researcher, the research participant* and the *research context* on the reliability of the data. Each of these terms will be used in the widest sense possible. The term researcher includes project leaders, interviewers, experimenters, participant observers and fieldworkers. Participants include individuals being observed, questioned (respondents), or a group of people who are being either observed or questioned. The research context refers to both the broad spatio-temporal circumstances under which research is conducted (for example, a particular year in a specific country with a specific socio-political system), and the specific spatio-temporal setting.

A further distinction is drawn between the characteristics and orientations of the researcher and the participant. Researcher or participant characteristics refer to attributes such as gender, nationality, age, socio-economic status and educational level. These characteristics are known as organismic variables. Researcher or subject orientations have reference to attitudes, opinions, expectations, preferences, tendencies and values.

**Figure 22.1** Factors that affect the reliability of data



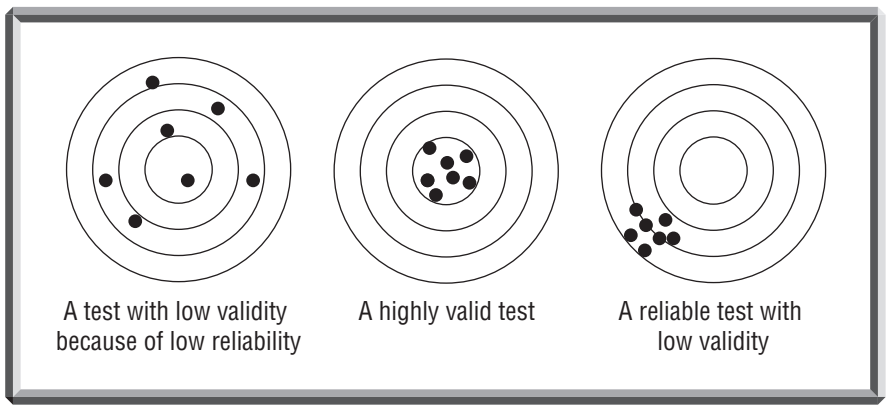
In accordance with common usage in the literature on experimental design, we shall refer to the consequences of the nuisance variables associated with each of the four variables as 'effects': researcher effects, participant effects, measuring instrument effects and context effects. Researcher effects are the negative consequences relating to validity that are directly attributable to the researcher. Similarly, measuring instrument effects are the negative consequences or lack of validity that may be directly attributed to some aspect of the measuring instrument.

These distinctions are schematically presented in figure 22.1.

A final note on the relationship between *measurement validity* and *reliability*. Reliability is a precondition for measurement validity. It is clearly impossible to expect accurate measurements, for instance when using a scale to measure your weight, if the instrument does not consistently produce similar readings. Some of the readings will be accurate and some not. At the same time, reliability is not the only precondition for measurement validity. You can have a scale that consistently gives you the wrong readings! This means that the readings are reliable but invalid.

The relationship between reliability and validity can be illustrated by the analogy between a measuring instrument (a test or scale or questionnaire) and a gun. An accurate and reliable gun will repeatedly hit the target in the centre. The shots are clustered (they have high reliability) and on target (high validity). If some shots are clustered but not on target, the gun is reliable but not very accurate. If the gun is not consistent (has low reliability) the shots will be all over the target and therefore inaccurate or invalid. These three options are illustrated in figure 22.2.

**Figure 22.2** Reliability and validity portrayed as an analogy to firing consistent and inconsistent guns at a target




## Concluding comments

The objective of data collection is to produce reliable data. This means that such data is consistent over time and place. But, as we shall see in detail in the following chapter, there are a number of potential sources of error that could result in the production of unreliable data. These sources of error or

observation effects have been classified into three categories, namely effects that are due to the researcher (researcher effects), those that result from the reactivity of the participant (participant effects) and those that follow from certain factors in the environment (context effects). We have also shown that, in many cases, measures to control these effects lead to higher levels of reactivity and hence to lower reliability. Social researchers have no choice but to strike a compromise between control (reducing error) and creating reactivity, in order to produce the highest degree of reliability possible.

# 23

# *Data collection (sources of error)*

**Central theme**

Three main kinds of observation effects are sources of error during the process of data collection. These are effects associated with the researcher himself, effects that originate with the participant or research subject, and context effects, which originate in the research setting. In each case, different subcategories and examples of these are discussed.

**Key concepts**

Observation effects – researcher effects – participant effects – Hawthorne effects – response sets – social desirability – expectancy effects – context effects.

## Main argument

The term 'observation effects' is used in a broad sense to include researcher, participant and context effects. These are sometimes also referred to as 'confounding' variables: that is, elements that pose a threat to the reliability of data collected. The aim in this chapter is to identify different kinds of confounding variables or sources of error and give examples from various kinds of studies. Although the examples are mainly derived from the experimental and survey research literature, they have a wider application.

## Elaboration: researcher effects

Our discussion of researcher effects is divided into two sections; in the first, we discuss effects associated with researcher *characteristics,* and in the second, those associated with researcher *orientations.*

### Researcher characteristics

Some of the most important researcher effects associated with specific researcher characteristics or attributes relate to the affiliation of the researcher, the image projected by the researcher to the research participants, and the distance between the researcher and the participants owing to differences between certain characteristics in the researcher and in the par-

ticipants. The latter category is hence not only an effect of researcher characteristics, but also arises from the interaction between characteristics in the researcher and those in the participants.

## Affiliation of the researcher

The researcher's association with a specific organisation may result in biased responses. If the interviewer is employed by a highly influential organisation that is known for the quality of its research, respondents are likely to be better motivated to answer questions seriously and truthfully. Universities and large research organisations usually have reputations of this nature. However, should the interviewer be associated with an organisation that elicits suspicion or with a completely unknown organisation, respondents are likely to react more negatively to the interview situation. Atkin and Chaffe (1972) found that the affiliation or presumed affiliation of interviewers played an important role in research related to government control of violence in television programmes. In cases where the respondents, who were parents, thought that the interviewer represented some government body, they were more inclined to give extreme responses to questions. See also Hyman's (1954:185 ff.) discussion of the influence of sponsorship on responses.

## Image of the researcher

In an important study, Jack Douglas (1976) discusses the problems surrounding conflict in research. According to him, a tacit assumption in research has always been that participants naturally wish to cooperate with the researcher, and that they would obviously provide valid and reliable information. However, Douglas maintains that the assumptions of what he calls 'the investigative paradigm' are far more realistic. The investigative paradigm is based on the assumption that social life is pervaded by profound conflicts of interest, values, feelings and actions (1976:55).

Based on a variety of studies that he conducted, including some in massage salons and on nudist beaches, Douglas found that suspicion and mistrust were the rule rather than the exception:

> *One manifestation of mistrust was in avoidance or evasive responses. Rather than being the exception, I suspect such evasiveness is the common situation in field research: People rarely tell the whole truth as they see it about the most important things, but they are generally being evasive or misleading rather than lying. A field researcher must understand this and the reasons for it: Primarily a fear of exposure, of being caught in a lie, and an unwillingness to appear less than absolutely 'moral' to an academic stranger* (1976:65–66).

A researcher is often seen as a stranger, an outsider, or an intruder. In the research conducted by Douglas these issues were probably given greater prominence as a result of the sensitive nature of his research. It seems fairly obvious that women in massage salons would regard the researcher as suspect since the possibility of him being a policemen cannot be excluded.

PART 3

The examples that we have discussed have all related to fairly general perceptions of the researcher as a suspect or stranger. At a considerably lower level Brislin *et al.* (1973) use the term rudeness as an all-embracing term to refer to the researcher as someone who interrupts the normal activities of the respondents. However, a variety of issues like the affiliation of the researchers, their interests and cultural background, and the time and place of the research all contribute to the image of the researchers: the positive or negative perception that the participants are likely to have of them.

## Distance between researcher and participant

A large body of research has been conducted in an attempt to establish which effects result from differences between the researcher and the participant. In some of the most important findings the existence of racial effects, gender effects, status effects, urban-rural effects, and even style-of-dress effects have been indicated. We shall consider a few of these studies.

In a recent study Campbell (1981) found race-of-interviewer effects similar to those found in earlier studies by Schuman and Hatchet (1974) and also by Hyman (1954). He concluded that racial differences between interviewer and participant may lead to a significant degree of bias. However, this bias is limited to the items in which the race of the respondent is explicitly mentioned by the interviewer. The direction of the observed bias is also constant in the sense that respondents consistently provide responses that are favourable to the race to which the interviewer belongs.

In a study on pre-marital sex, Zehner (1970) found that the responses of male participants were not influenced by the gender of the interviewer. In comparison, female participants tended to be far more reticent when they were interviewed by female interviewers. However, in his study on controversial issues related to sexual intercourse, Rangonetti (1970) found no significant differences between the answers provided by those who were interviewed by male and female interviewers respectively. What he did find was that, irrespective of the gender of the interviewer, respondents were significantly more open in their responses when they were interviewed by a single interviewer than in a group interview situation.

Mendras (1969) attempted to establish whether differences in rural and urban background between the interviewer and the participant had an influence on response bias. Giles and Chevasse (1975) in turn attempted to establish whether the interviewer's style of dress had any influence on participants' responses. Their conclusion was that style of dress could have an even greater influence on response than the perceived status of the interviewer!

In a more recent publication, Sudman and Bradburn (1982) found that the distance created between participant and interviewer as a result of interviewer and participant characteristics should not be seen as an issue separate from the content of the questions posed. It has already been noted that racial differences are only found when the content of the question includes a reference to the race of the respondent, and that gender factors were found to be sensitive in Zehner's study only when the items referred to sexually sensitive themes. According to Sudman and Bradburn, the *per-*

*ceived* threat of a question is of greater importance than the other issues. People are simply reluctant to reply to questions that deal with sexual behaviour, alcohol consumption, traffic offences, possession of firearms and the use of drugs. It is hence hardly surprising that when questions are posed that relate to sexual behaviour, which is a sensitive topic, and these questions are posed by members of a specific gender, gender effects will be observed. The same would apply if questions on race relations were to be asked by interviewers from a race group other than that of the interviewee.

## Researcher orientations

From research conducted over a broad spectrum it can be concluded that the final data is clearly influenced by the prejudices, expectations, attitudes, opinions and beliefs of the researcher, and that this applies equally to an interview, a laboratory or a field situation.

Hyman attempted to systematise the influence of researcher orientations by identifying three types of orientation effects in interview situations:

- bias-producing cognitive factors in the interviewer;
- attitude structure expectations; and
- role expectations.

In the first category Hyman included the *cognitive factors* that could result in specific expectations in terms of respondents' answers and are unique to the interviewer. These factors include specific beliefs and perceptions. As an example, Hyman quotes the following passage in which a female interviewer discusses her attitudes towards respondents:

> *When asked whether she could make guesses about the attitudes of the respondents, she replied: "I often get fooled. On Russian questions I perhaps unconsciously make guesses. But if I do that I'm likely to write down what I think. Therefore I try not to". But when the issue is pursued by asking her whether there are any characteristic types of respondents, she says: "Once they start talking, I can predict what they'll say …"* (1954:58).

Hyman justifiably maintains that expectations of this nature may constitute an important source of bias if the interviewer allows herself to be led by them in her further probing, classification of responses and so on. Under the second category that Hyman refers to as *attitude-structure expectations,* he notes the fact that some interviewers tend to believe that the attitudes of respondents are likely to display a uniformity of structure. This leads to a situation where the interviewer expects the respondent to answer later questions in a schedule in accordance with responses provided earlier on. This situation is clearly reflected in a statement like: "Once they start talking, I can predict what they'll say …" (Hyman, 1954: 59).

The third category of orientation effects, which could perhaps more appropriately be referred to as *expectancy effects,* (or role expectations as Hyman calls them), is defined as follows: we might conceive of role expectations to denote the tendencies of interviewers to believe that certain attitudes or behaviours occur in individuals of given group memberships, and

therefore to expect answers of a certain kind from particular persons (1954:61). Role expectations, which frequently lead to the development of rigid stereotypes, are especially prevalent in cases where men have certain views of female roles, where whites have specific perceptions about blacks, youth about the aged, or the inverse, and so on. As an illustration of this phenomenon, Hyman refers to the remark by a male interviewer who said: "I just don't think the average woman has as much social consciousness as the average man" (1954:61).

Rosenthal and his coworkers systematically studied similar expectancy effects in experimental studies. One of the best-known studies on experimenter expectancy effects was conducted by Rosental and Fode (1963) with laboratory rats. The experimenters were undergraduate psychology students who were led to believe that they would acquire practice in established experimental procedures. One half of the experimenters were told that the rats that they would use had been bred from exceptionally intelligent blood stock, while the other half were also inaccurately informed that their rats were less gifted. In actual fact the rats had been randomly selected from a homogeneous rat colony and there was no reason to expect that there was any difference in their intelligence. The final results confirmed the expectancy effect: the first group of experimenters, who had expected their rats to learn more quickly, reported that this had indeed been the case, whereas the second group with the supposedly dull rats reported that their rats had acquired the skills less quickly.

In a recent review of the literature on interviewing techniques, Campbell *et al.* (1981) comment on a similar orientation effect which they refer to as reinforcement and feedback. They emphasise the fact that several studies have shown that, when the interviewer provides positive feedback for instance by saying uh-uh or good, this has a definite influence on subsequent responses. In some cases the interviewer's systematic approval of a response could have a biasing effect on the information obtained.

## Elaboration: participant effects

The mere fact that human beings are being studied leads to atypical behaviour. It is probably safe to claim that the first description of participant effects in the literature of the social sciences is to be found in the publication by Roethlisberger and Dickson (1939). Four researchers, Mayo, Roethlisberger, Whitehead and Dickson, did a research project at the Hawthorne factory of the Western Electric Company in 1927. The original intention was to study the effects of working conditions such as temperature, lighting, rest periods and hours of work, on worker productivity by observing six female workers. The interesting and unexpected finding was that the workers' performance increased irrespective of the variable being manipulated. Irrespective of whether working hours were increased or reduced or rest periods lengthened or shortened, productivity consistently increased. The researchers interpreted their findings as meaning that the employees felt flattered to have been able to participate in the experiment! It has subsequently become common practice to refer to this type of participant effect as the Hawthorne effect.

## Participant characteristics

In the preceding section we considered the influence of some of the better-known participant characteristics such as gender, racial group and status in the interaction between researcher and participant. We now turn briefly to another three well-known subject effects: memory decay, the omniscience syndrome and interview saturation.

### Memory decay

According to Smith (1975) the researcher has to accept the fact that there is a natural decay in the ability to remember events that have positive correlations with:

- the length of time that has elapsed since the occurrence of the event;
- the irregular occurrence of the event;
- the relative unimportance of the event; and
- decreased accessibility to relevant data relating to the event.

### The omniscience syndrome

Some respondents appear to believe that they can answer any question. The researcher must be sensitive to this type of effect to avoid the inclusion of responses that are not authentic. Brislin *et al.* (1973) discuss this phenomenon in more detail.

### Interview saturation

Pareek and Rao (1980) justifiably maintain that some members of society, and particularly those who live in metropolitan areas, have become so strongly conditioned to market surveys that they tend to answer questions mechanically and superficially. Apart from the fact that this type of attitude can be identified in the interview situation, initial refusal or reluctance on the part of the respondent is usually also a good indication of over-saturation.

## Participant attitudes

### Role selection

One of the most radical participant effects is the participant's perception of his or her role in the research setting. Webb *et al.* justifiably maintain that:

> *By singling out an individual to be tested (assuming that testing is not a normal condition) the experimenter forces upon the subject a role-defining decision – What kind of person should I be as I answer these questions or do these tasks?* (1966:16).

Webb *et al.* also maintain that the role selection effect is likely to be manifested in a variance between 'don't know' responses and the measurement of imaginary attitudes and opinions. If, for example, the instructions to the interviewee were to read: "You have been selected as part of a scientifically

designed sample … It is important that you should answer all the questions …", the importance and uniqueness of the respondent are obviously emphasised. When instructions like these play an important role in the interview situation, it is not at all difficult to predict that fewer 'don't know' responses will be found, and that more imaginary attitudes and opinions will be measured.

## Level of motivation of the participant

One of the most important variables that can influence the validity of the data collection process either positively or negatively, is the participant's level of motivation. The level of motivation is clearly influenced by a variety of factors such as interviewer characteristics, contextual factors and the manner in which the questions are phrased. Two issues may be emphasised in this context: the degree of interest that the topic has for the interviewee, and the extent to which he or she is likely to feel threatened by the questions that are posed. It has been empirically demonstrated that the more interesting the respondent finds the topic, the more highly motivated he or she will be and this in turn results in an increase in the response rate. As indicated earlier, the level of threat posed by the questions will have an important bearing on people's willingness to respond to them, and also on their level of motivation. Questions that relate to highly private issues are likely to be perceived as threatening by the majority of respondents, and they are likely to respond unreliably. For this reason Cannell and Kahn maintain that the interviewer must make the interviewing experience and task sufficiently meaningful, rewarding and enjoyable to attain and maintain the necessary respondent motivation (1968:574).

## Response patterns

One of the most important types of observer effect in interviewing is the occurrence of systematic response patterns that are generally referred to as 'response sets'. A number of authors, including Cronbach (1946), Kolson and Green (1970), and Webb *et al.* (1966), have addressed this matter. Kolson and Green focus on the fact that children are inclined to gamble when they are unsure of the meaning of items. Similar response patterns noted, particularly when the meaning of an item is obscure, include a tendency to endorse only the extremes on scaled items (extreme checking style), or to check the midpoints of the scale (central tendency). For purposes of our discussion, we shall highlight two well-known types of response patterns: *social desirability* and the *acquiescence response set.*

The Hawthorne effect is clearly an example of a social desirability tendency. According to Selltiz and Cook most individuals will try to give answers that make them appear well-adjusted, unprejudiced, rational, open-minded and democratic (quoted in Smith, 1975:136). Rosenberg was also able to confirm that individuals who attained high scores on Marlow-Crone's Social Desirability Scale were more inclined to supply extremely positive responses than those with low scores on the scale.

The tendency to answer either yes or no to virtually all the items in a questionnaire or scale is referred to as the *acquiescence response set.* As early

as 1937, Sletto found that respondents were more likely to agree with a statement than to disagree with its inverse. In a more recent and detailed study of this issue, Schuman and Presser (1981, chapter 8) were able to confirm earlier findings on this topic. Apart from the fact that they were able to confirm the existence of this type of response pattern, which can produce differences that range between ten and fifteen per cent, they also found indications that this phenomenon is more likely to occur amongst respondents with a low level of education than amongst for instance university graduates. However, these researchers maintain that we have not yet built up a large enough body of research on the phenomenon of the acquiescence response set to be able to provide an adequate interpretation of the reasons underlying this type of response pattern.

## Elaboration: context effects

When discussing the research context one can distinguish between *broader spatio-temporal factors* that are determined by historical, socio-political, and economic factors, and the narrower *research setting* within which the research is conducted. With regard to the former the researcher must be sensitive to the following types of factors:

- The period during which the research is conducted. It is particularly relevant in the case of *longitudinal* research where changes in behaviour or attitudes are investigated and significant changes could be the result of external events such as elections, civil unrest, or increased unemployment.
- Cultural factors such as habits, traditions, customs and institutions. The anthropological literature abounds with examples in which researchers, to their own detriment, have failed to take local conventions and customs into account in the design and execution of their research.
- Political factors such as the existence of interest groups, lack of freedom, and intimidation.

The importance of this issue is associated with the perceived 'neutrality' of each setting. In the first two, the respondent is familiar with the setting, but the researcher is not. However, the third and fourth categories are neutral territories. Studies on the influence of the research setting have shown that the researcher's impressions of the participant's home or place of work frequently led to significant data bias. The respondent's role (see our earlier discussion on role selection) is also directly influenced by the research setting. In the domestic setting a woman's role as a mother may be more noticeable, whereas her role as employer or supervisor may be more noticeable in the workplace.

# 24

# *Data collection (ensuring reliability)*

**Central theme**

In the previous chapter we identified three main sources of error during data collection. This chapter outlines a number of strategies to reduce error during data collection.

**Key concepts**

Triangulation – anonymity – confidentiality – rapport – covert research – experimental and control groups – constructive replication.

## Main argument

The wide range of observer effects identified in the previous chapter illustrates how reactivity may influence the collection of data in social research. Although it is usually practically impossible for any researcher to identify and control for all of these effects, he still has a responsibility to plan and execute a study in a manner that will minimise the combined effects of various threats to validity. We now turn to some of the methods that the researcher can use to control for some of the effects. Our discussion does not address specific techniques, which may be found in the publications cited. Our primary concern is with the broad issues.

## Triangulation

A first general principle in data collection is that the inclusion of multiple sources of data collection in a research project is likely to increase the reliability of the observations. Denzin (1978) coined the term *triangulation* to refer to the use of multiple methods of data collection. Campbell and Fiske (1959) suggested a similar strategy which they called *multiple operationism*. Both of these concepts refer to the use of a variety of methods and techniques of data collection in a single study. The underlying assumption is that, because various methods complement each other, their respective shortcomings can be balanced out.



It is important to bear in mind that specific types of data collection are

designed for collection of certain types of data. In a classic article in 1962, Morris Zelditch distinguished between three types of information: frequency distributions, incidents or events, and institutionalised norms and status. For each of these types of information there is a prototypical method of data collection, which encompasses the use of surveys for information concerning incidents and the use of informants or interviews for information on norms and status. Zelditch's classification also illustrates the fact that each type of method has specific limitations. By employing different methods of data collection in a single project we are, to some extent, able to compensate for the limitations of each.

In an earlier section, we focussed on the fact that not all methods are equally reactive. It is hence an important principle to supplement the more reactive methods such as direct observation, with less reactive methods, such as the use of documentary sources.

Two examples of triangulation will illustrate the advantages of such an approach. One of the observation effects identified in the previous chapter is associated with item sensitivity. We have specifically indicated that items that address issues relating to race and sex are likely to result in considerable response variability, particularly when there have been no controls for the race and gender of the interviewer. In the event of such a variation occurring in response to sensitive questions, more reliable information is likely to be obtained by doing a follow-up study using in-depth interviews. Similarly, where historical events are being investigated and memory decay may play an important part, the reliability of the information can probably be increased by the use of documentary sources like diaries and letters.

## Ensuring anonymity

As indicated by Schuman and Presser (1981), respondents tend to be reluctant to provide interviewers with information on sensitive matters. A similar problem surfaces in studies of sensitive behaviour such as so-called deviant behaviour. Douglas indicated that subjects tend to be unusually reluctant or unwilling to participate because they regard the investigation as an invasion of their privacy. The fact that his investigations concerned situations of a sensitive nature – massage parlours and nudist beaches – obviously contributed to this kind of response!

One possible strategy to reduce the effect of such responses would be to emphasise the anonymity of responses and observations where possible. Rather than face-to-face interviews, it may for instance be possible to use postal or telephone surveys. Nevertheless, respondents are not necessarily convinced that the latter approaches actually ensure their anonymity. In the case of studies on so-called deviant behaviour, the assurance that the investigator will not identify the respondents in any way, must be regarded as a minimum requirement for establishing greater validity.

## Establishing rapport

As opposed to anonymity one could use a strategy of trying to establish the best possible interpersonal relationship or rapport with the respondent.

This strategy is obviously time consuming, and it might hence not always be practical. Douglas (1976) reported that a year had elapsed before they discovered that one of their most trustworthy participants had been using a 'nom de plume' all along.

The advantage of a strong interpersonal relationship between researcher and participant is that it neutralises initial distrust. It can also serve as a control for role selection effects. If the respondent trusts the interviewer, there is no longer any need for any kind of role playing. The establishment of good rapport can also serve as a control for context effects.

## Covert research

A more drastic strategy is to make use of some form of covert research. Covert observation may assume a variety of guises. Basically, it amounts to the researcher deceiving the participant about the actual purpose of the research or about the identity of the researcher. In such cases all possible measures are taken to ensure that the participant does not become aware of the fact that he or she is part of a research project. A good example of this type of research is Simon Holdoway's study (1982) of police brutality. Because he suspected that he would not obtain reliable data in any other way, Holdoway resorted to covert research. He went as far as joining the police force, undergoing the necessary training, and spending several months serving as a policeman on patrol duty. With a single exception, nobody knew that his eventual aim was to conduct a sociological study of police activities.

Covert research is particularly applicable in studies where participant observation or in-depth-interviewing is used. These are studies in which it is essential for the researcher to establish close ties with the group being investigated while keeping his/her actual identity from them. Other types of covert research are encountered where researchers disguise the fact that research is being conducted. An example of this method is found in the study conducted by Schwartz and Skolnick (1962) in which letters of application for employment were manipulated to investigate the effect of a criminal record on 'suitability for appointment'.

For a more detailed discussion of experimental designs in the natural context (field experiments) where some form of disguise is used, the reader can refer to Campbell (1969). One of the most common examples of deception in laboratory experiments is to be found in so-called blind and double-blind designs. In blind experimental designs the participants do not know whether they are part of the experimental group or the control group, whereas in double-blind experimental designs there is the additional requirement that the experimenters do not know whether they are dealing with the experimental group or the control group.

Effective covert research is obviously a useful strategy for countering the general guinea-pig effect. Where research participants are unaware of the fact that they are being studied they cannot react to the fact of being investigated. Covert research also controls for expectancy effects. In the example of the double-blind experimental design, one of the most important causes of expectancy effects is eliminated.

Although the use of covert strategies like disguise, deception or withholding information is one of the most effective ways of minimising or even eliminating error, there are fundamental ethical objections to the wholesale use of this approach. Covert research necessarily implies that the subject is deceived, or that his/her right to privacy is infringed on, or that he/she has to be lied to. The dilemma confronting the researcher is hence how to weigh the moral interests of the subject against the interests of science. A number of authors have proposed suggestions on ways to neutralise the negative ethical implications of covert research.

One approach involves requesting the subject's permission to use the information gathered, immediately after completion of the study while obviously still ensuring the subject's anonymity. Martin Bulmer's *Social research ethics* (1981) may be consulted for an excellent exposition of the ethical implications of participant observation and covert research.

## Control group

It has always been the norm to use control groups in experimental studies wherever possible. Apart from the experimental group to which the specific experimental treatment is applied or in which given interventions are made, a comparable control group, which does not undergo the experimental treatment, is used. In an attempt to ensure that the experimental and control groups are comparable, techniques such as random assignment of participants to either the experimental or control groups (randomisation), or matching of participants in the two groups is used. This enables the researcher to draw causal inferences with a higher degree of validity.

A control group facilitates control for participant effects such as maturation, history and selection effects. However, researchers who intend to use an experimental approach are cautioned to study carefully the most important participant effects that are likely to occur in different types of experimental design and the measures that may be taken to eliminate these (cf. Cook and Campbell's excellent book (1979) on quasi-experimentation).

## Training

Adequate training of experimenters, interviewers, research assistants and fieldworkers is a precondition for any research. One of the specific aims in such training is to counteract researcher effects. In our discussion of researcher effects, we noted the negative consequences of researcher orientation effects, and particularly those associated with researcher expectation effects. The likelihood of obtaining reliable data is increased when interviewers are given clear instructions regarding the aims of the project, and the importance of accurate and consistent interviewing is emphasised. Thorough prior training is also likely to eliminate or reduce the occurrence of some of the other researcher effects that we have not discussed, such as inaccurate noting of responses, coding errors, classification errors and many more.

PART 3

## Selection of fieldworkers

The cause of one of the more important researcher effects can be found in the (perceived) distance between researchers and participants. Although various factors such as context or level of motivation result in greater degrees of distance between researchers and participants, researcher characteristics such as gender, race, age, and style of dress are some of the most important factors that fall under this rubric. An obvious solution to this problem is to exercise due care in the selection of fieldworkers. Fieldworkers who share as many characteristics of the sample as possible (for instance gender and race) ought to be given preference.

## Replication studies

In conclusion, one can hardly overemphasise the importance of the principle of replication. As Barber (1976:87) notes, a variety of factors contribute to the situation where exact replication in the social sciences is virtually impossible. Following Lykken's (1968) lead, Barber argues in favour of more constructive replication by stressing that more investigators should try to confirm empirical relationships claimed in earlier reports while the replicator formulates his own methods of sampling, measurement and statistical analysis (1976:87).

Constructive replication implies that the researcher wishes to control the findings of an earlier study by investigating the same problem for a different sample and/or by using a different research design. A good example of such studies is included as reading 2.

## Summary

At the beginning of our discussion on data collection in chapter 22 we emphasised the distinctive nature of the research domain in the social sciences. It is precisely because the social world is 'populated' by human beings who are thinking, emotional, historical, cultural beings that we encounter 'reactivity' in social research.

The fact that the term *observation effects* was used as a general term for the various effects that complicate the data-collection process, may have created the impression that human rationality, historicity, and normativeness were used in an exclusively negative sense. However, the aim of the discussion on the various types of effects was rather to sensitise the researcher to the variety of ways in which human nature may influence research findings. In suggesting certain control measures and design considerations to minimise error during data collection, the aim is not to deny the human dimension of the research process. On the contrary, emphasising the necessity of research design is probably the greatest recognition one can accord to the distinctively human nature of the research domain in the social sciences!

# 25

# *Data analysis and interpretation*

**Central theme**

Analysing data usually involves two steps: first, reducing to manageable proportions the wealth of data that one has collected or has available; and second, identifying patterns and themes in the data. These issues are discussed, together with the distinction between quantitative and qualitative data analysis.

**Key concepts**

Analysis – synthesis – quantitative and qualitative analysis – descriptive statistics – inferential statistics – univariate, bivariate and multivariate statistics – statistical significance.

## Main argument

The term 'analysis' basically means the 'resolution of a complex whole into its parts'. In this sense, it is usually contrasted with the term 'synthesis', which means 'the construction of a whole out of parts'. These terms were originally used in the domain of logic.

In quantitative approaches to empirical research, 'analysis' refers to the stage in the research process where the researcher, through the application of various statistical and mathematical techniques, focusses separately on specific variables in the data set. The word 'synthesis' is not used that often in empirical studies, but it would have a meaning similar to the term 'interpretation'. Interpretation refers to the stage in the research process where the researcher tries to 'bring it all together', either by relating the various individual findings to an existing theory or hypothesis, or by formulating a new hypothesis that would best account for the data.

There are fundamental differences between quantitative and qualitative research in terms of data analysis. In the discussion in the remainder of the chapter, I shall first elaborate on the notion of quantitative (statistical) analysis and then refer to some of the distinctive features of qualitative data analysis. In the final section, I shall discuss the more general issue of drawing valid conclusions from data, irrespective of the kind of data.

## Elaboration: quantitative (statistical) data analysis

This discussion will be confined to statistical data analysis, although the general category of quantitative analysis would normally also include math-

PART

3

ematical techniques and computer simulation studies. The aim here is not to discuss specific techniques of statistical analysis, but rather to provide a framework that could be used in making more sense of such techniques.

In various chapters of the book we have introduced terminology that is used in statistical analysis: words such as variables, levels of measurement, and relationships between variables and cases. A useful way to look at statistical analysis is in terms of the 'data matrix'. A 'data matrix' is defined as any array of figures or numbers where the rows are the cases and the columns are the variables. The cells of a data matrix represent the actual values of each variable as it applies to a specific case.

Assume that we undertook a survey of the attitudes of full-time third-year students at three universities (Cape Town, Stellenbosch and Western Cape). We are specifically interested in testing a number of hypotheses, namely whether there is a link between 'university' and 'political affiliation in terms of party political support'; whether there is a relationship between gender and political affiliation; and whether there is a relationship between ethnic group and political party affiliation. The data matrix in table 25.1, which constitutes an excerpt from the total data set, contains information on twenty cases (individual students) and the variables: gender, ethnic group, university and political party support. The value labels are as follows:

Gender: 1 = Male, 2 = Female; Ethnic group: 1 = African black, 2 = 'Coloured', 3 = White; University: 1 = UCT, 2 = US, 3 = UWC; Political party support: 1 = ANC, 2 = NP.

**Table 25.1** Data matrix of hypothetical study at three Western Cape universities

| Cases | Gender | Ethnic group | University | Political Party | Age |
|---|---|---|---|---|---|
| 1 | 2 | 3 | 2 | 2 | 19 |
| 2 | 1 | 1 | 1 | 1 | 20 |
| 3 | 2 | 2 | 3 | 1 | 23 |
| 4 | 1 | 3 | 2 | 2 | 20 |
| 5 | 2 | 3 | 1 | 2 | 20 |
| 6 | 2 | 3 | 1 | 2 | 19 |
| 7 | 2 | 2 | 2 | 2 | 19 |
| 8 | 1 | 2 | 2 | 1 | 21 |
| 9 | 1 | 2 | 3 | 2 | 21 |
| 10 | 2 | 2 | 3 | 2 | 20 |
| 11 | 1 | 3 | 2 | 2 | 19 |
| 12 | 2 | 1 | 1 | 1 | 18 |
| 13 | 1 | 1 | 1 | 1 | 18 |
| 14 | 2 | 1 | 3 | 1 | 19 |
| 15 | 2 | 3 | 2 | 2 | 20 |
| 16 | 2 | 3 | 1 | 2 | 20 |
| 17 | 2 | 1 | 3 | 1 | 19 |
| 18 | 1 | 2 | 3 | 1 | 20 |
| 19 | 1 | 3 | 2 | 2 | 19 |
| 20 | 2 | 3 | 1 | 2 | 19 |

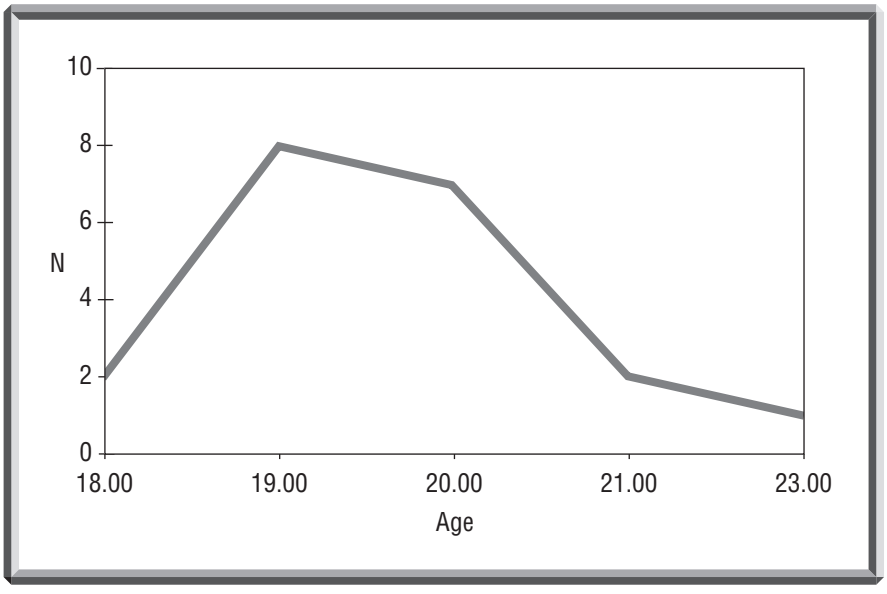
The domain of statistics has traditionally been divided according to two main functions, namely descriptive statistics and inferential statistics. *Descriptive statistics* is concerned with organising and summarising the data at hand (for instance the sample data), to render it more comprehensible. *Inferential statistics* deals with the kinds of inferences that can be made when generalising from data, as from sample data to the entire (target) population.

Descriptive statistics can be further divided according to the number of variables that the researcher focusses on: if a single variable is studied the process is known as univariate analysis, when two variables are studied we refer to this as bivariate analysis and when more than two variables are studied we refer to it as multivariate analysis. We shall now discuss briefly the differences between univariate and bivariate descriptive statistics and inferential statistics, using a simple example from our data set. The purpose of this discussion is to give the reader an impression of what is involved in the process of quantitative data analysis and to elaborate on some of the underlying principles. For a detailed discussion of the variety of statistical techniques the student is referred to any good introductory statistical textbook.

## Univariate analysis

Univariate analysis is sometimes seen as the first step in the analysis chain, as a stage of data cleaning (Singleton, 1993). During this stage the aim is to get a clear picture (or more coherent feeling) of the data by examining one variable at a time. Univariate 'images' or 'pictures' of data come in various forms, namely frequency and percentage tables, graphs (bar charts and histograms) and charts (pie charts) and statistical indexes. Figure 25.1 is a frequency polygon of the distribution of age in our sample.

**Figure 25.1** Frequency polygon on the distribution of age



The specific techniques used will depend on the level of measurement of the variable: nominal/ordinal level data allows for certain techniques (frequencies, percentages), whereas interval level data allows for more powerful statistical analysis (means).

Using our data on university students, we could for instance have done a simple frequency and percentage analysis of political party affiliation as illustrated in table 25.2.

**Table 25.2** Frequency/percentage distribution of political party support (1996: Study of three Western Cape universities)

| Code | Label | Frequency | Percentage |
|---|---|---|---|
| 1<br>2 | ANC<br>NP | 8<br>12 | 40<br>60 |
| Total | | 20 | 100 |

The scores in the columns under 'frequency' and 'percentage' are referred to as the frequency distribution and percentage distribution of scores on the variable (political party affiliation). If we were to do similar univariate analyses on the other three variables we would find that sixty per cent of the sample are female and forty per cent male; twenty-five per cent are African blacks, thirty per cent are 'coloureds' and forty-five per cent are whites; thirty-five per cent are students at UCT, thirty-five per cent at US and thirty per cent at UWC. It should be obvious that these statistics (frequencies and percentages) of the four variables provide us with a much clearer and manageable picture of the data. In fact, the impact of such summary statistics is really only felt when the number of cases becomes quite extensive (hundreds and thousands of cases rather than just twenty).

We can also get a picture of a distribution by looking at its respective statistical properties. Three kinds of *measures of central tendency* are usually distinguished, namely the mean, the median and the mode. These measures indicate various points of concentration in a set of values. The *mean* is the arithmetical average, calculated by adding up all the responses and dividing by the total number of respondents (the mean age of our group is 19,65). The *median* is the midpoint in a distribution, or the value of the middle response; half of the responses are above it and half are below. The *mode* is the value or category with the highest frequency (in our example, the modal value of political party support is 2). The other class of properties that provides a statistical summary of the data is the *degree of variability or dispersion* in a set of values. The simplest dispersion measure is the *range*, which is the difference between the lowest and highest values in the data set. In our example the age of our students ranged between 19 and 24. Of several other measures of dispersion, the most commonly used is the *standard deviation.* This is a measure of the 'average' spread of observations around the mean. The third statistical property that is usually distinguished refers to the *shape of a distribution.* This property is most readily apparent from a graphic presentation called a *frequency* or *percentage polygon.*

## Bivariate analysis

Univariate analysis is a useful tool to give the researcher a feel for the data. It is also an essential stage in the quality check of a data set. But, as noted in chapter 15, researchers are more often than not interested in relationships between variables. In our example, we formulated three hypotheses regarding such relationships: between university and political party support, between ethnic group and political party support and between gender and political party support.

The researcher generally asks two questions in this regard: does the hypothesised relationship exist (or is it the result of random error), and secondly, how much effect or influence does one variable have on the other. As with univariate analysis, the choice of the actual technique depends on the level of measurement. We shall consider an example of a bivariate analysis involving nominal scale variables.

When the tables analysed have only a few categories, as in many nominal level measurements, bivariate data is presented in tables. Such tables are known as cross-tabulations or contingency tables. A cross-tabulation requires a table with rows representing the categories of one variable and columns representing the categories of the other. When a dependent variable can be identified, it is customary to make it the row variable and the independent variable the column variable. In our case we would define 'party political support' as the dependent variable and 'ethnic group' as the independent variable. Let us return to our example and illustrate a cross-tabulation between ethnic group and political party affiliation.

**Table 25.3** Cross-tabulation of ethnic group by political party support

| Political party | Ethnic Group | | | Row |
|---|---|---|---|---|
| | African black | 'Coloured' | White | Total |
| ANC | 5<br>2,0<br>62,5%<br>100,0% | 3<br>2,4<br>37,5%<br>50,0% | 0<br>3,6<br>,0%<br>,0% | 8<br>40,0% |
| NP | 0<br>3,0<br>,0%<br>,0% | 3<br>3,6<br>25,0%<br>50,0% | 9<br>5,4<br>75,0%<br>100,0% | 12<br>60,0% |
| Column | 5 | 6 | 9 | 20 |
| Total | 25,0% | 30,0% | 45,0% | 100,0% |

[Chi-square = 13,75 (Df = 2, prob <,001)]

Even a cursory look at the table reveals a clear link between ethnic group and political party support. All the African students support the ANC, coloured students are divided in their support of the ANC and the NP, whereas all the white students indicated their affiliation to the NP. This is already strong evidence in favour of our second hypothesis. The other two hypotheses can be tested in the same way.

But the interesting question about relationships is not whether they are found in samples of populations, but whether they reflect the true population values (cf. chapter 21 on sampling). The question is not simply whether a relationship exists in the *sample data*. The researcher must also determine whether the observed cell frequencies reveal a true relationship between these variables in the *population* or whether they are simply the result of sampling error (bias) and other random error (chance). This leads us to a brief discussion of the concept of statistical significance.

## Inferential statistics

The statistic most commonly used to establish whether the observed results in a cross-tabulation represent true population values is the chi-square (or $x^2$) test for independence. The chi-square test is based on a comparison of the observed cell frequencies with the cell frequencies one would expect if there were no relationship between the variables. Table 25.3 presents the count (frequency), expected cell frequencies, row percentages and column percentages. The larger the differences between the actual cell frequencies and those expected assuming no relationship, the larger will be the value of chi-square and the more likely that the relationship exists in the population. When we report chi-square values as being (statistically) significant, we are saying that it is highly unlikely that the results that we obtained were due to some form of sampling or random error.

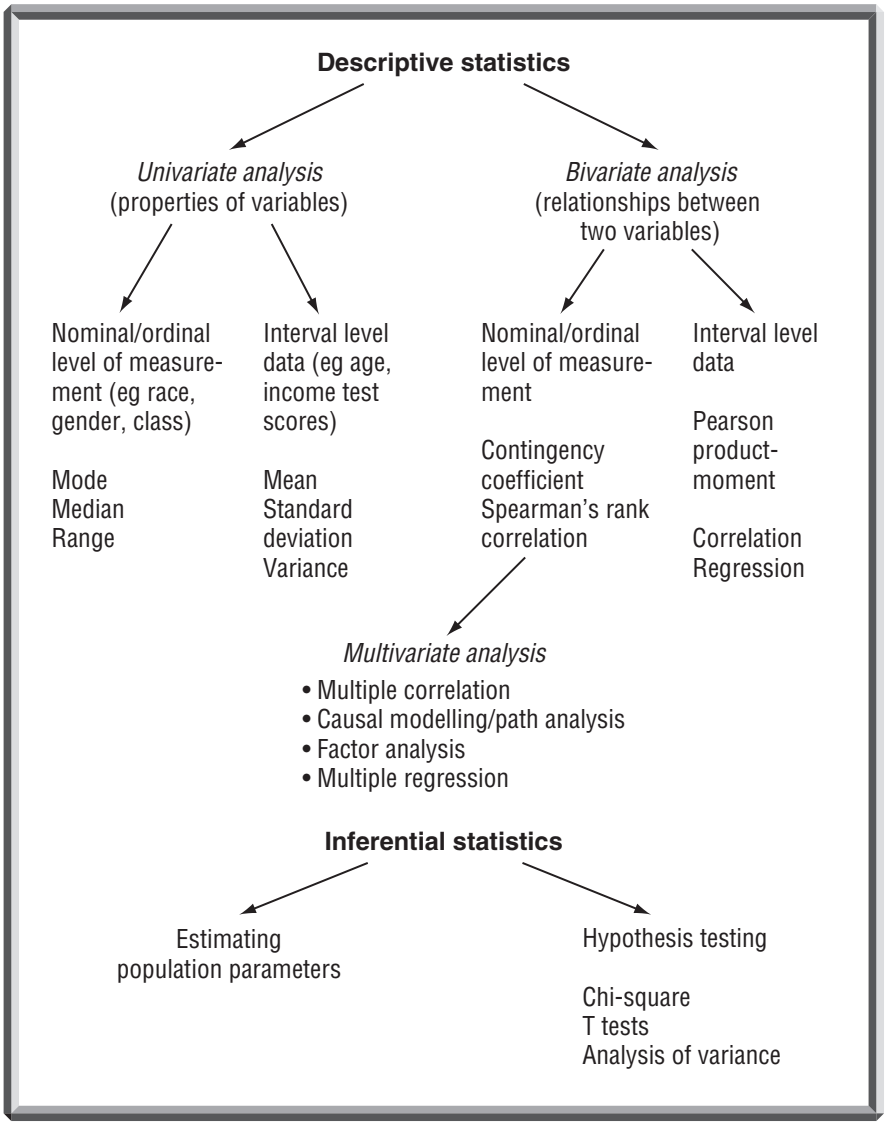
In conclusion: data analysis is all about investigating variables, the relationships between variables and the patterns in these relationships. Figure 25.2 summarises some of the main statistical techniques as they fit into the above distinctions.

## Qualitative data analysis

Most qualitative researchers would not deny the value of quantitative analysis, even in so-called qualitative studies. However, they will certainly object to the wholesale use of such techniques to the exclusion of other methods of analysis. Let me refer to a typical formulation of a qualitative approach that is based on symbolic interactionism, which is a sociological tradition that has its roots in a rejection of the basic tenets of a positivist view of social reality.

In a recent article, Paul Rock (1982) gave a useful summary of the main principles of symbolic interactionism as it applies to social research. According to Rock, symbolic interactionism emphasises three fundamental features of social life. Firstly people can make reflexive use of the symbols they employ, that is to say, they can interpret and unravel the meanings of events without merely reacting to them. Secondly people are symbolic

**Figure 25.2** Statistical techniques and their applications




objects to themselves. They constantly construct, judge and modify themselves as social entities. Thirdly perspectives and plans emerge from the interplay between a socially constructed self and a socially constructed environment. Selves and settings are lent an additional structure by their location in time. They are awarded biographies, and their emergent properties are traced to define a range of possible futures (Rock, 1982:35).

Against this set of philosophical principles, symbolic interactionism is concerned with four levels of analysis: It is concerned with:

- the ways in which the self renders its environment socially significant, is transformed by such a rendition and construes the environment anew;

- the way in which social worlds are built by negotiated perspectives that continually redefine reality;
- the manner in which social worlds influence one another and make new constellations of meaning possible; and
- the relationship between such worlds and the larger, overriding symbolism that lends coherence to society.

According to Rock, such an approach to social inquiry has the following practical implications for data analysis:

- Any attempt to divide the social world into discrete parts must be rejected. Methods such as computer simulations and statistical analysis, which represent any such form of discrete analysis, are therefore not acceptable.
- Symbolic interactionists attempt to relate the procedures that are routinely employed to build up 'social scenes'. Any practice that invokes causes, forces or principles that are too abstract from the actor's perspective, is held to lack credibility.
- A further consequence of adopting such a level of magnification is that interactionism commands a reluctance to generalise features of social worlds. Perspectives, meanings and identities are inextricably anchored in their contexts. A person praying, drinking or fighting is accorded social significance in terms of the setting of his or her behaviour.

In concrete terms it means that qualitative analysis focusses on:

- understanding rather than explaining social actions and events within their particular settings and contexts;
- remaining true to the natural setting of the actors and the concepts they use to describe and understand themselves;
- constructing, with regard to the social world, stories, accounts and 'theories' that retain the internal meaning and coherence of the social phenomenon rather than breaking it up into its constituent 'components'; and
- contextually valid accounts of social life rather than formally generalisable explanations.

Because of this emphasis on the integrated, meaningful and contextual nature of social phenomena, qualitative researchers have had to develop new methods and strategies of 'analysing', or even better, of 'interpreting' and 'understanding' the social world. Examples of such approaches are:

- The grounded theory approach (Glaser and Strauss, 1967);
- analytic induction (Znaniecki, 1934);
- phase analysis (Lofland, 1971);
- phenomenological analysis (Giorgi, 1983);
- discourse analysis; and
- conversation analysis.

Some of the principles of qualitative data analysis have actually been operationalised and are now used in computer software programmes such as Ethnograph, Nud*ist and Kwalitan. For an authoritative and recent overview of such programmes, compare Weitzman and Miles (1995).

In conclusion: the approaches of quantitative (statistical) and qualitative analysts are clearly quite different. The quantitative researcher analyses data by looking at the particular elements, first in isolation (univariate statistics) and then in various combinations with other elements (bivariate and multivariate statistics). A crucial question in generalising studies is whether the results obtained from the sample data are representative of population characteristics. This question leads to the use of inferential statistics to either estimate population parameters (such as the population mean or proportion) or test hypotheses (by using chi-square tests and analysis of variance techniques).

In qualitative research, the investigator usually works with a wealth of rich descriptive data, collected through methods such as participant observation, in-depth interviewing and document analysis. The research strategy is usually of a contextual nature. This implies a focus on the individual case (or small number of cases) in its specific context of meanings and significance. Analysis in these cases means reconstructing the inherent significance structures and the self-understanding of individuals by staying close to the subject. This approach is known as the insider perspective. The overall coherence and meaning of the data is more important than the specific meanings of its parts. This leads to the use of methods of data analysis that are more holistic, synthetic and interpretative.

## Assignment

1. There are a number of surprising, even anomalous, findings in the Smith and Glanz study (reading 3). How do they interpret these results and what explanations do they put forward to account for these surprising results?
2. In the discussion of the results of his own research and of Schuman's earlier studies (reading 2), Hill suggests three possible explanations of the findings. Which explanations does he find to be most plausible and for what reasons?

# 26

# *Writing the research report*

**Central theme**

A research report represents a reconstruction of the research process. The logic of the report is the logic of argumentation. This means that a report is written to present one's case as logically and persuasively as possible. Different contexts of report writing, with their respective criteria, are subsequently discussed. The chapter concludes with a list of guidelines on writing reports in the social sciences.

**Key concepts**

Research report – dissertation – journal article – metatheoretical guidelines – theoretical guidelines – methodological guidelines.

## Main argument

In a recent study Böhme defends the view that *argumentation* constitutes the unique context of science and in this way determines the nature of scientific communication.

> *In contrast to most other types of communication scientific communication, however, is argumentation: the coherence of communication is the coherence of an argumentative context. This thesis may seem trivial, but that it is not so is shown by the fact that scientific communication is frequently understood to be an exchange of information. Even the communication of pure measurement results usually is the adducing of empirical evidence for a hypothesis or even is itself an empirical hypothesis for which theoretical arguments have to be brought forward in the publication* (1975:206).

Böhme compares the act of scientific communication, as distinct from the research process, with the traditional context of validation or justification. Scientific communication or reporting is an act of validation; an act in which the scientist argues for a specific view, hypothesis or finding relative to the position taken by other scientists. The logic of reporting is the logic of validation. It is the act of advancing arguments or reasons, empirical or theoretical, in support or refutation of a specific hypothesis or finding.

This reference to the 'logic of social inquiry' should remind you of the PEC-framework discussed in chapter 12. The basic logic of all research

is captured in the specific relationship between the research problem, the evidence collected and the conclusions drawn on the basis of the evidence.

At the same time, a central theme in this book is that research is a social activity. We have, in line with numerous prominent scholars (including Kuhn, Barnes, Hägstrom, Knorr-Cetina and Ravetz) emphasised the *social* nature of scientific praxis. Research occurs in different social and academic contexts, ranging from the specific interests of a research project, through the institutional, to national and international contexts (cf. chapter 10).

Scientific report writing does not take place in a vacuum. The nature of scientific communication, of which research reports or dissertations and articles are prime examples, is determined by the very logic of social science. Like the study itself, the nature of the report is a function of factors such as the purpose of the study, the interests of the researcher and the practical constraints of resources. In the following discussion we show how the 'logics' of different research contexts lead to differences in report writing. We shall distinguish between a master's thesis, a doctoral dissertation and a journal article.

## Kinds of reports

As the word suggests, a *master's thesis* indicates that its author has mastered a certain domain of research or a topic. The master's thesis provides, or should provide, evidence that a person has mastered the knowledge and skills appropriate to a certain subject. What does this mean? Clearly it must mean that the master's candidate has read and understood the most important previous research on a particular topic. It must also mean that the candidate has successfully integrated such previous research into a new, interesting research problem. Furthermore it means that the candidate has been able to design and execute a research project and has employed the appropriate methodologies to addresses the research problem adequately. And it finally means that the researcher is able to analyse and interpret the results of his or her study in a meaningfully and coherently. The emphasis in assessing a master's thesis is hence on whether the candidate provides sufficient evidence of having mastered the skills involved in these various activities, namely literature review, formulating the problem, designing a study and analysing and interpreting the evidence. Put briefly, the master's candidate must 'prove' to the reader (and especially to the supervisor) that he or she knows how to do proper research!

All of these requirements apply equally to a *doctoral study.* At doctoral level it is taken for granted that the candidate has the required knowledge and skills in a specific domain. The additional and crucial criterion of a doctoral study is that the candidate must make some contribution to the existing body of knowledge. Innovation and novelty are key requirements at this level. Just being able to demonstrate mastery of a topic will not suffice. The doctoral student also has to add to our collective understanding of the social world. Such a contribution can take various forms such as testing existing theories and models and making suggestions for their improvement, evaluating social interventions in order to improve their efficacy,

analysing certain key concepts in a discipline and improving our understanding of these.

A researcher starts writing and publishing *journal articles* after having mastered a certain domain and also when he/she has something new to contribute to the topic. A journal article is far more focussed and specific than a master's thesis or a doctoral dissertation. An article reports on new empirical findings or a new conceptualisation of an old problem, without providing extensive coverage of the literature. Of course, it is so that different contributions to journals have different aims. Examples of differences in approach are standard research articles; state-of-the-art reviews, which must cover the most recent literature; and discussion articles, which engage in debate with other scholars; and book reviews.

I want to relate this discussion to the comment above on the logic of research. I shall show that the PEC-framework is useful in understanding the different requirements and interests of the three kinds of research reports that we have discussed. My basic point is simple: the relative weight of each of these 'elements' (P, E and C) differs in each of these cases. Let us summarise the central requirement of each kind of report:

- A master's thesis: to prove that one has mastered a certain topic.
- A doctoral dissertation: to make a contribution to the body of knowledge.
- A journal article: to contribute to a topical and well-defined research issue.

I believe that the above implies that a master's candidate must devote a disproportionate part of the actual thesis to a literature study and a discussion of the research design. It is through a literature review and the subsequent formulation of the research problem that we get an idea of the candidate's knowledgeability and skill in that area. The discussion of the research design and methodology also gives an indication of whether the candidate 'knows what she is doing'.

In addition to what is required at master's level, a doctoral student must present the new findings or insights in some detail. Not only must she provide evidence of how the findings were arrived at, which involves the same steps as at the master's level, but why these results are worth noting. This means that the weight of the reporting shifts noticeably from a focus on the statement of the Problem and the design/collection of the Evidence to the presentation and discussion of the Conclusions.

In an important sense, a journal article is a smaller version of a doctoral dissertation. When an article is accepted by a good quality journal, the scientific community assumes, although not always uncritically, that the article is the outcome of extensive and well-designed research. This implies that, with the exception of state-of-the-art reviews, normal journal articles will not include extensive literature reviews, simply because we assume that the author knows what he/she is doing. The reader can already assess whether the researcher is 'in touch' with the field by checking which references have been cited.

This discussion is summarised in table 26.1. Although it might seem somewhat artificial to assign a value to each of the main 'elements' in a

study, it does illustrate how different contexts of report writing influence the logic and structure of a report.

**Table 26.1** Percentage of respective types of report allocated to problem, evidence and conclusions

| PEC-framework | Type of report | | |
|---|---|---|---|
| | **Master's (70–100 pp)** | **Doctoral dissertation (200–300pp)** | **Journal article (20pp)** |
| Problem (including literature review) | 30% | 20–30% | 10–15% |
| Evidence (design and execution) | 30%+ | 20%+ | 10–15% |
| Conclusions | 40% | 50–60% | 70–80% |

## Guidelines to report writing

The guidelines or criteria for better report writing that are discussed below, summarise some of the main points made in the book, especially in this section. Although the student can use these as a kind of 'checklist' when writing a report, they should also act as a reminder of the kind of issues involved in actual research.

Four categories of guidelines are distinguished, namely theoretical, metatheoretical, methodological and technical.

## Theoretical guidelines

It is generally accepted that scientific research does not take place in a vacuum. Although studies or projects are written and published individually, they always form part of a particular theoretical framework. Knowledge in a given field of research should logically form part of a series of interdependent preceding studies and also of some of the theories or models that exceed the boundaries of those used in the particular framework.

Given the importance of the *argumentative* context of scientific research, it follows that a literature survey should not simply comprise a mechanical description of existing theories: one or more theoretical views should be integrated with the logic of the research objective or task. For example, the researcher should be able to answer the following questions:

- How does the central theme of the investigation relate to other research and existing theories?
- Does the introduction to the study include an explanation of the manner in which the basic argument of the research has been integrated into the wider framework of relevant theory and research?

PART 3

**GUIDELINE 1**
The research project should be integrated into the wider framework of relevant theory and research reflected in a review of the literature.

The primary constituents of theories are undoubtedly the concepts in which the researcher categorises the social world as it is observed. Scientists do not always attach the same meaning to concepts. In addition, the social scientist, in contrast to the natural scientist, usually employs lay or everyday terms. It is mainly for these two reasons that concepts with more than one meaning are sometimes used by researchers in a somewhat individualistic way. This happens more frequently when the research deals with problems in which the researcher is personally involved. These considerations form the context of the second guideline.

**GUIDELINE 2**
All central or important concepts or constructs of the study should be defined explicitly.

## Metatheoretical guidelines

It is generally accepted in philosophy of science today, that no research findings can be *conclusively* proved on the basis of empirical research data. In different stages of the scientific research process and for different reasons the researcher is compelled to make assumptions about specific theories and methodological strategies that are not tested in the specific study. One important category of such assumptions comprises the metatheoretical or metaphysical assumptions underlying the theories, models or paradigms that form the definitive context of the study.

Because of the argumentative and public nature of scientific communication, this often tacit dimension of scientific practice should be made explicit.

**GUIDELINE 3**
The scientist should spell out clearly the methatheoretical assumptions, commitments, (pre)suppositions and beliefs that are applicable to her research.

## Methodological guidelines

The quality of research findings is directly dependent on the methodological procedures followed in the study. For this reason researchers should provide a complete account of the way in which their research has been planned, structured and executed.

The most important steps in the research process, namely the statement of the research problem, the research design, and information on data col-

lection, analysis and interpretation should be incorporated in the specification of methodological guidelines.

## Research problem

In empirical research the *research hypothesis* directs the investigation, while in theoretical research, the *central theoretical thesis* serves this purpose. In addition, core concepts in the statement of the problem must be clearly defined and in empirical research, also operationalised.

**GUIDELINE 4**
The research hypothesis or central theoretical thesis must be clearly formulated and operationalised.

## Research design

A research design is an exposition or plan of how the researcher plans to execute the research problem that has been formulated. The objective of the research design is to plan, structure and execute the relevant project in such a way that the validity of the findings is maximised.

Three aspects are usually included in the research design, namely the aim of the research, data or information sources and considerations of validity and reliability.

### The aim of the research

At the very outset the researcher should state the aim of the project, whether it is exploratory or validational, hypothesis testing or hypothesis generation.

**GUIDELINE 5**
The research report should specify the aim or objective(s) being pursued.

### Data or information sources

There are a variety of data sources available for social sciences research. There are physical sources, documentary sources, and indirect and direct observation. Indirect observation includes the use of questionnaires, interviews, scales and tests. Irrespective of the data sources used, the researcher should also report on:

- the nature, credibility and relevance of the sources (especially in the case of documentary sources); and
- the representativeness of the sources.

In empirical research on individuals, representativeness refers to the problems related to sampling. In these cases the researcher is required to pro-

vide adequate information on aspects such as the sampling techniques and the demographic characteristics of the sample.

**GUIDELINE 6**
Information should be provided on the nature, credibility, relevance and representativeness of data and information sources.

### Reliability and validity

In the research design stage researchers should already be considering the factors that could prevent them from making valid inferences. In theoretical research this problem emerges as a problem of objectivity. Examples of such factors include selection of only those views and arguments that support the researcher's views, insufficient provision of supporting evidence or reasons for the final conclusion, and implicit prejudice. In empirical research the researcher should take account of a variety of confounding variables that could threaten the final validity of his findings. The aim of a research design is, after all, to employ various measures to control for systematic bias, confounding variables and other sources of error.

**GUIDELINE 7**
The research report should include information on the ways in which the reliability or validity and objectivity of the data or information have been controlled.

## Data collection

Regarding data collection, the researcher should report on the methods and techniques of data collection, the period during which the project was executed, and the events that could at the time have had an influence on the data collected and the controls used to ensure that the process of data collection yielded reliable data. Where standardised measuring instruments such as questionnaires and scales have been used they are usually appended at the end of the thesis or dissertation. In the case of journal articles, these would be incorporated into the article.

**GUIDELINE 8**
The research report should contain detailed information on the methods and context of the data collection.

## DATA Analysis

Analysis includes both qualitative approaches such as historical and conceptual analysis, and quantitative approaches. It is generally accepted that

empirical data can be analysed in different ways. Different approaches to such analysis can sometimes lead to different findings. A few examples are the different ways in which large data sets can be reduced. These include analysis of covariance, and bivariate and multivariate approaches. Since different approaches often enjoy virtually the same validity, the researcher must give reasons for specific choices.

**GUIDELINE 9**
The procedures used for analysis should be described in full.

## DATA Interpretation

In both theoretical and empirical research, the report should be concluded with an interpretation of the findings against the background of the original research problem. The criteria of objectivity demand that the interpretation should not be selective, but that data should be reported in full. A valid conclusion is one in which the data (empirical) or reasons/evidence (theoretical) provide both *sufficient* and *relevant* grounds for the conclusion.

**GUIDELINE 10**
The interpretation and conclusions should be provided within the framework of the original research problem and design and should include all the relevant information or data.

## Technical guidelines

Diverse factors govern the technical editing of a report. The nature and extent of an investigation will obviously determine aspects like the length of the report. The most important aspects to be taken into consideration when editing a report, article or dissertation are:

- the format: the length of the text (A4 or A5) and line spacing;
- the length;
- the number of copies;
- the reference style;
- the necessity for acknowledgements; and
- the summary.

The precise nature and content of each of these factors will depend on the context of the report. Articles submitted to journals are usually required to comply with the conventions of the journal in question. Universities also have strict rules regarding theses or dissertations submitted to them, while organisations such as the Human Sciences Research Council have their own sets of criteria for research reports. The only guideline that can hence be formulated, is guideline 11.

PART 3

**GUIDELINE 11**
The research report should comply with the technical guidelines in terms of format, length, number of copies, reference style and summary as laid down by the organisation or journal concerned.

## Conclusion

The structure of a typical dissertation or thesis is summarised in table 26.2.

**Table 26.2** Structure of a thesis

| The thesis | Main purpose |
|---|---|
| Introduction<br>(One or two chapters, depending on the scope of the literature review) | • Formulate research problem<br>• Purpose of study<br>• Literature review<br>• Definitions of key concepts |
| Research design<br>(Usually one chapter) | • Operationalisation<br>• Description of measuring instrument<br>• Sampling design<br>• Description of data collection<br>• Methods of data analysis |
| Findings<br>(Numerous chapters, depending on how the data is organised and presented) | • Discuss results in terms of research problem and research hypothesis (where appropriate)<br>• Relate findings to literature review |
| Conclusions, interpretation and recommendations<br>(Final chapter) | • Integrate results into main conclusions as they impact on the central research problem of study<br>• Where appropriate, make recommendations about further research and other activities |
| Appendices<br>References | |

PART

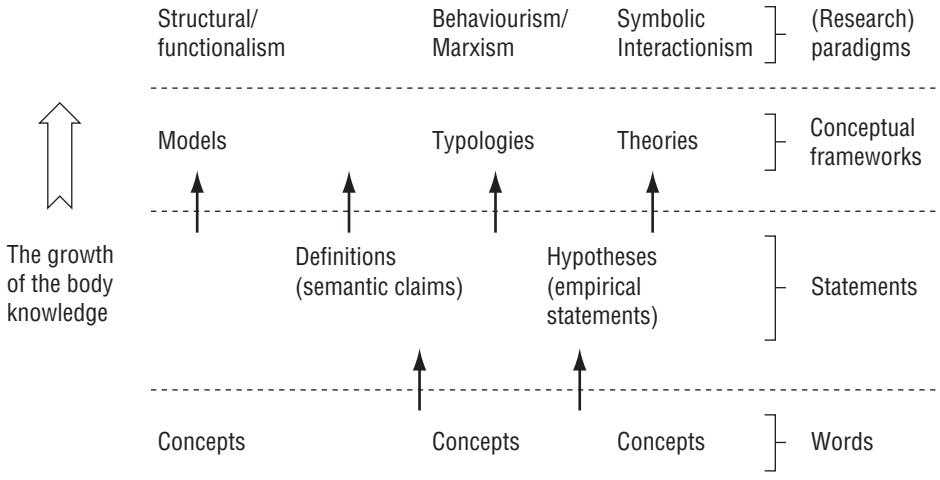
# 4

# *The building blocks of science*

## Overview

What are the main 'components' of social knowledge? At the most basic level, scientific knowledge is made up of concepts; concepts are our links with the social world. Concepts act as the 'carriers' of meaning, that is, they enable us to identify and refer to social phenomena (suicidal acts, personality disorders, population characteristics) by defining the characteristic features of such phenomena. But concepts as such do not make any claims about the world. For this we have to combine concepts into sentences that make statements or propositions and distinguish between sentences that make semantic or meaning claims (definitions) and those that make epistemic or knowledge claims (empirical propositions or statements). But on their own, individual statements (even generalisations) are inadequate if we wish to understand and explain social phenomena. In order to reach a higher level of generality, we need to combine statements (definitions and empirical statements) into more complex kinds of conceptual frameworks, viz. typologies, models and theories and eventually very broad theoretical paradigms or research traditions. This 'hierarchy', which is based on increasing generality, is represented in the figure below.

**The Body of Knowledge**



# 27

# *Scientific concepts*

**Central theme**

Concepts are the primary 'building-blocks' of scientific knowledge. Concepts are, as it were, the 'carriers' of meanings of words, thereby enabling us to classify and categorise phenomena in the social world correctly. We distinguish between the connotation (or 'sense') and denotation (or 'reference') of concepts. A special class of concepts, namely constructs, is discussed because of their importance to science.

**Key concepts**

Connotation – denotation – theoretical concepts – constructs – subjective connotation – conventional connotation – first-order and second-order constructs.

## Main argument

Concepts may be defined as the most elementary symbolic constructions by means of which people classify or categorise reality. Concepts are, as it were, the 'pigeon-holes' into which we sort our unstructured empirical experiences; they are the primary analytical instruments by means of which we come to grips with reality. One could say that concepts are the symbolic constructions by means of which people make sense of and attribute meaning to their worlds. A concept is a symbol of meaning. It has become customary to distinguish between two interpretations of the word 'meaning', namely connotative and denotative meaning.

Copi defines the differences between connotative and denotative meaning as follows:

> *In one sense the meaning of a term consists of the class of objects to which the term may be applied. This sense of meaning, its referential sense, has traditionally been called extensional or denotative meaning. A general or class term denotes the objects to which it may be correctly applied, and the collection or class of these objects constitutes the extension or denotation of the term … The collection of properties shared by all and only those objects in a term's extension is called the intension or connotation of the term* (1972:125).

General or class terms have both connotative and denotative meanings. An example is the connotation of the term 'skyscraper', which includes all the characteristics that are common and distinctive to buildings of a certain height. The main characteristic would be a minimum height, say 300 metres. The denotation of 'skyscraper' is the class of phenomena which would then include all the buildings, such as the Empire State Building and the World Trade Centre, that meet this defining characteristic.

It is useful to distinguish between two further uses of the term 'connotation', namely subjective and conventional. The *subjective connotation* that a specific person attaches to a word refers to the particular class of characteristics that she believes are characteristic of objects or phenomena denoted by that word. Obviously the subjective connotation of a word will vary from one person to the next. The specific connotation that a person would attach to words such as 'freedom' and 'justice' would be closely associated with that person's particular mindset and previous experiences.

Although a person would therefore use ordinary terms such as 'beautiful' and 'ugly' in interpersonal communication, and would usually understand what other people mean when they use the terms and be understood by others when using these words, the user would obviously sometimes attach specific idiosyncratic connotations to these terms. It is indeed so that beauty is in the eye of the beholder!

A word's *conventional connotation* is its assumed or accepted meaning – the meaning that has implicitly been agreed upon for the sake of communication. People agree to use words in a specific manner to ensure communication and conversation.

This distinction between subjective and conventional connotation is also applicable to the social sciences. To some extent, each researcher uses scientific concepts in an idiosyncratic manner (subjective connotations) that is associated with specific theoretical preferences, training, interests, and so on. Nonetheless, researchers within the same discipline and more specifically within the same paradigm or research tradition, tend to share specific conventional connotations. Because concepts have, at least to a certain extent, specific meanings within a given theory or theoretical tradition, researchers from the same paradigm are obviously more likely to be able to communicate with relatively greater ease than would be the case between researchers from different schools or paradigms. In the remainder of the book the term 'connotation' will be employed with reference to the conventional connotation.

## Elaboration on constructs

Many of the key concepts of the social sciences tend to be highly abstract. Some of these concepts originated, not in the concrete world of everyday life, but rather through abstract theoretical analysis. Examples are terms such as 'alienation', 'alter ego', 'cognitive dissonance', 'relative deprivation', 'need achievement', 'commodity fetishism' and 'class consciousness'. Many of these concepts came into being when a new theory, usually a highly complex one, was developed and are therefore also referred to as 'theoretical concepts' or 'constructs'. Because of the way in which constructs

came into being, their ontological status is often in dispute. One may ask: Do such constructs denote or refer to real entities or structures? If a specific term is developed entirely within the framework of a specific theory, does it have an existence that is independent of that theory? Do terms such as 'id, ego,' and 'superego' (Freud), 'cognitive dissonance' (Festinger), 'anomie' (Durkheim) and 'class consciousness' (Marx) refer to actually existing structures or entities in the social world or are they the fictitious creations (hence 'constructs') of highly imaginative social scientists? This is not the place to discuss this highly philosophical problem. It will suffice to note the very real denotative problem of a significant number of concepts in the social sciences. The obvious solution to the problem is to operationalise constructs rigidly and accurately. This issue is discussed in some detail in chapter 20.

An important observation that follows from the discussion in the preceding paragraph is that the denotations of theoretical concepts are largely, if not entirely, determined by their connotations. For the simple reason that concepts of this nature neither developed nor were given meaning in the concrete world of everyday experience, but originated within the theoretical 'space' of a conceptual framework, their denotations are primarily dependent upon the connotation. For example, the phenomena that are classified under 'alienation' are largely determined by the connotations that are associated with the concept in theories of alienation. In contradistinction, the denotations of everyday 'concrete' concepts such as dogs, cars, trees, furniture, books, tables, and so on are reasonably fixed. Consequently, the conventional connotations that are attached to these concepts are also reasonably fixed. The relationship between the connotations and the denotations of concepts may be summarised as follows:

- In the case of highly theoretical concepts or constructs, the denotations of the concepts are largely determined by the connotations that are attached to them within the framework of the relevant theory.
- In the case of the more concrete concepts that are associated with everyday experience, the denotations frequently determine the conventional connotations that are attached to the concepts.

Another implication of the discussion thus far is that concepts, and specifically theoretical concepts, frequently have more than one connotation. Because, for example, there are several theories of alienation, there are also different definitions of the term. As a result, different social scientists frequently interpret and categorise the same phenomenon in different ways.

A good example of the manner in which individuals define their immediate social environments in different ways is found by comparing Karl Marx's conceptualisation of social stratification with that of Max Weber. According to Marx, social stratification (the unequal ranking of socially defined positions in society) is the consequence of the capitalistic system of production in which the haves and the have-nots are differentiated into two permanently antagonistic classes. He argued that all class-differentiated societies are characterised by a mutually antagonistic relationship between a minority of 'non-producers' (who dominate the means of production)

and a majority of 'workers' (who own no property, but produce the surplus production which forms the basis of the wealth of the non-producers). In a modern capitalistic society this antagonistic relationship is manifested as a class struggle between the capitalists and the proletariat, who are mainly industrial workers in the urban industrial centres. While Marx viewed the stratification process as the consequence of private property or, differently stated, as a result of economic power or the absence thereof, Max Weber identified other determinants of stratification. He distinguished between three broad dimensions or hierarchical systems of stratification to indicate the economic, social and legal-political facets of society. This scheme produces three main stratification structures: class, status and power. Each of these three hierarchical systems is manifested in a specific group context, namely classes, status groups and political parties.

Weber defined 'class' primarily in terms of economic considerations as denoted by an individual's position in the market in relation to the resources in society, especially property; 'status' was seen as an expression of social honour and prestige; and 'power' was associated with a person's political bargaining position. It is hence clear that Weber viewed social stratification as a multidimensional phenomenon that involved more than Marx's class dichotomy. He also demonstrated that a person need not necessarily be placed at the same level in each of these three hierarchical systems. A person who has achieved a high class and political (power) position might well have a low ranking in terms of social prestige.

## On conceptual relativity and the nature of social science concepts

Because concepts 'provide access' to empirical experience, social scientists who adhere to different theories of the same construct will often end up studying slightly different 'slices' of the world. In its extreme form, this is the problem referred to by Kuhn as the 'incommensurability thesis' (cf. also chapter 30). According to him, the fact that scientists operate within different conceptual frameworks makes communication between them impossible and excludes any comparison between theories.

In our view this point of view is too radical for two reasons (Kuhn also, incidentally, toned this down in subsequent publications). Firstly this would only apply to highly theoretical concepts, whereas there is a good deal of overlap between more concrete concepts. Secondly it is certainly true that even the more abstract theories usually include a number of lower-level terms which would constitute a degree of overlap in meaning between theories.

The question of conceptual relativity is also linked to the issue of how scientific concepts are formed. At this point, the more quantitative researchers and the more qualitative or naturalistic researchers tend to part ways. The more naturalistic researchers argue that, unlike the natural sciences tradition, a significant proportion of social science concepts is derived directly from social actors in the social world. In fact, some philosophers have argued that this is one of the distinctive features of social science.

In an article entitled *Concept and theory formation in social science,* Schutz (1951) formulates his famous distinction between the first- and second-order constructs of the world of social inquiry:

> *The world of nature, as explored by the natural scientist, does not 'mean' anything to molecules, atoms and electrons. But the observational field of the social scientist – social reality – has a specific meaning and relevance structure for the human beings living, acting and thinking within it. By a series of commonsense constructs they have pre-selected and pre-interpreted this world which they experience as the reality of their daily lives. It is these thought objects of theirs which determine their behaviour by motivating it. The thought objects constructed by the social scientist, in order to grasp this social reality have to be founded upon the thought objects constructed by the commonsense thinking of men, living their daily life within their social world. Thus, the constructs of the social sciences are, so to speak, constructs of the second degree, that is constructs made by actors on the social scene, whose behavior the social scientist has to observe and explain in accordance with the procedural rules of his science* (Schutz, 1945:59).

This interpretation of the relationship between social science concepts and the everyday constructs (or typifications as he calls them), leads Schutz to formulate two methodological postulates: the postulate of logical consistency and the postulate of adequacy.

> *… these constructs are by no means arbitrary. They are subject to the postulate of logical consistency and to the postulate of adequacy. The latter means that each term in such a scientific model of human action must be constructed in such a way that a human act performed within the real world by an individual actor as indicated by the typical construct would be understandable to the actor himself as well as to his fellow-men in terms of commonsense interpretation of everyday life. Compliance with the postulate of logical consistency warrants the objective validity of the thought objects constructed by the social scientist; compliance with the postulate of adequacy warrants their compatibility with the constructs of everyday life* (Schutz, 1945:63–4).

In a more recent article, Charles Taylor defends a position that is very similar to that of Schutz. He writes:

> *There is a constant temptation to take natural science theory as a model for social theory: that is, to see theory as offering an account of underlying processes and mechanisms of society, and as providing the basis of a more effective planning of social life … But the big disanalogy with natural science lies in the nature of the commonsense understanding that theory challenges, replaces or extends. There is always a pre-theoretical understanding of what is going on among the members of a society, which is formulated in the descriptions of self and other which are involved in the institutions and practices of the society* (1981:92–3).

This particular feature of social research is recognised more clearly in qualitative than in quantitative studies. One of the distinctive aspects of qualitative research is the fact that the researcher attempts to understand people

in terms of their own definitions or selfdescriptions and concepts of the world. In terms of Becker's distinction the focus is on an *insider perspective* rather than on an *outsider perspective* on the social world. In qualitative research the natural and subjective components of the social world are emphasised. From a naturalistic perspective, one of the major aims of research is to correctly identify the native or indigenous concepts of the subjects being investigated. It is only after having correctly identified and understood such 'indigenous' concepts that the researcher attempts to integrate them within a larger interpretative framework. In this sense qualitative research is a more 'bottoms-up' approach that starts with concepts and conceptualisations existing in the social world and integrates them into second-order constructs in the world of science, whereas quantitative studies use a more 'top-down' approach that applies existing scientific conceptualisations in studying the social world.

Norman Denzin, a prominent qualitative researcher, summarises this approach as follows:

> *Naturalists link their theoretical components to the empirical world through the collection of behavior specimens. They operationalize those concepts through a careful analysis of their specimens. Starting with loose sensitizing definitions of their concepts, they empirically operationalize the concepts only after having entered the worlds of interaction that they wish to understand … They include as many behaviors as possible as indications of the concept in question, through the use of naturalistic indicators which represent any segment of the subjects … An indicator is naturalistic if it derives (preferably spontaneously) from the subjects' world of meaning, action and discourse – it is not imposed on that world by the observer* (1978:103).

Typically, the concepts generated in qualitative or naturalistic studies are therefore concrete concepts. Incidentally, this discussion illustrates why the labels 'quantitative' and 'qualitative' have only limited application. The distinction between these different approaches to conceptualisation and theorising, is better captured by the terms 'naturalistic' and 'formalistic'. In a naturalistic approach the investigator's point of reference is the concept as used 'naturally' by social actors in the social world. In a more formalistic approach, a social scientist starts theorising from within the world of science, either by using an existing theory or developing a new one. In this process, which is removed from the concrete social world, such conceptualisations are more often than not fairly abstract and formal and the challenge is then to link these conceptual frameworks to the social world through the process of operationalisation.

## Critical reflection and assignment

Compare the construction and usage of social science concepts in two separate and different studies: the one more formalistic or quantitative and the other more naturalistic and qualitative.

Choose any studies from recent journals in your discipline. Show how the way in which concepts (and their indicators) are defined, differs in quantitative and qualitative studies.

# 28

# *Definitions and empirical statements*

**The central theme**

There are two main classes of propositions or statements in science: statements of meaning (definitions) and statements of fact (empirical statements). Definitions are of two kinds: theoretical definitions and operational definitions. Similarly, there are two kinds of empirical statements: descriptive (or factual) statements and explanatory (or theoretical) statements.

Keywords

Theoretical definitions – operational definitions – indicators – empirical statements – descriptive or factual statements – theoretical or explanatory statements – causal mechanisms – causal claims.

## The main argument

In this chapter we move a step up in the hierarchy of knowledge: from concepts to statements or propositions. All statements are made up of concepts. It is customary to distinguish between two kinds of statements: statements that aim to define the meanings of words or concepts (definitions), and statements that make empirically testable claims about the world (empirical statements).

## Elaboration: definitions

A 'definition' is a statement that delimits or demarcates the meaning of a word in terms of its sense and reference. A definition such as 'a horse is a four-legged herbivorous land mammal', does not make any knowledge or epistemic claim about the world. What it does is to present us with a list of characteristics (also called 'descriptors') which conveys a certain idea, namely what is meant by the term 'horse'. It furthermore enables us to identify those 'entities' in the real world that we would include under the class of 'horse'. This is the distinction between theoretical (connotative) and operational (denotative) definitions.

PART

4

## Theoretical definitions

The specification of the connotative meaning of a concept, namely the general intention or 'idea' that it incorporates is usually referred to as the theoretical or connotative definition. Through a theoretical definition the relationships between a given concept and related concepts within a specific conceptual framework (model or theory) are brought into focus.

Let us look at an example from the physical sciences. In theories developed during the eighteenth century, 'heat' was defined as a type of liquid. Our concept of electrical current can still be traced back to this view. Nowdays, however, 'heat' is defined as a form of energy. This shows that concepts may have different connotations, depending on the currently accepted theory within which they occur and from which the definitions are derived. The same variation in meaning applies to different theoretical or high-level abstract concepts such as energy, gravitation, space and time.

This is equally, if not more true of concepts in the social sciences. The meaning of 'culture', for example, would differ in materialist-evolutionist, idealist, and structural-functionalist frames of reference. The same applies to numerous other concepts such as violence, aggression, culture and intelligence.

In a recent publication on 'ethnicity' in South Africa, Simon Bekker (1993) presents an overview of 'local' definitions and conceptualisations of the term 'ethnicity'. He refers to them as 'scholarly representations'. For our purposes, his distinction between liberal, Marxist and Afrikaner-nationalist conceptualisations of 'ethnicity' is useful. According to Bekker, the liberal school of thought viewed racial identities primarily as an imposed category, thereby precluding individual freedom and interaction, ideals that are of paramount importance to liberals. "This idea of race uses the term in its 'official' and imposed sense as an outcome, rather than as a 'formation', rather than as a construct in the minds of different South Africans" (1993:45).

Within the Marxist framework, on the other hand, race is viewed 'structurally', as being imposed by the state, as being supportive of capitalistic interests, and therefore as being inimical to the interests of the black working class (1993:49). As Bekker remarks: "race is viewed as an ideological outcome rather than as a subjective construct". Within Afrikaner nationalism, the ethnic group became the essential category. One's identity and worth as an individual is defined by group membership. It is well known that identification of ethnic identity with 'volk' became one of the founding principles of the apartheid system.

We here have examples of two conceptualisations of ethnicity (Marxist and liberal) that view it in an exclusively negative way, whereas Afrikaner-nationalist thinkers used the same term in a positive and legitimating way in their theoretical frameworks. Bekker argues that, in South African academic circles, we are currently witnessing a new, less emotionally laden appreciation of the value of the notion of 'ethnicity'. One might argue that recent work in this regard is in fact developing a new conceptualisation.

This brief discussion illustrates the fact that theoretical definitions of highly abstract concepts vary across larger frameworks and paradigms. The

same word will have different connotations, both positive and negative, depending on the theoretical framework. This does in fact lead people to look at the social world differently and interpret seemingly similar events differently. The social scientist still has a responsibility to ensure that his/her definitions are as clear and unambiguous as possible!

## Operational definitions

In an attempt to counter the problems associated with variance in meaning, researchers emphasise the importance of making the denotation of concepts explicit. In other words, what exactly is being referred to, or what does the concept indicate? The reference of a concept is specified by an operational definition of that concept.

As the name suggests, an operational definition of a concept describes certain operations, usually some type of measurement, under which the use of the concept is valid. In other words, an operational definition presents specific conditions for the appropriate use of a specific concept, conditions that state that the execution of certain operations will result in specific results.

Singleton *et al* (1993) make the valid point that the operational definition of concepts involves increasing shifts from the abstract to the concrete. In this process, the aim of operational definition is to identify the 'indicators', the specific events or phenomena, that truthfully represent an abstract concept. We have to realise that many social science concepts are not directly observable. We cannot observe 'education', 'culture' or 'ethnicity' directly in the sense that we can see a schoolbuilding or a painting. On the other hand, while we cannot see education, we can observe its manifestations: the fact that certain people manifest behaviour that we define as typical of 'educated people', for instance that they are more knowledgeable and more learned and skilled. While we cannot see prejudice, we can observe and measure whether certain people, for instance whites, avoid interaction and contact with certain other people, for instance blacks, and whether they make derogatory statements about members of other race groups and oppose actions to integrate different race groups.

Incidentally, it is precisely at the point where we move from concepts and their theoretical definitions to the manifestations of concepts and their operational definitions, that we change from the language of concepts to a language of variables. Singleton *et al.* (1993) are absolutely right in maintaining that it is not always easy to pinpoint exactly where this shift in language occurs and it is also true that researchers tend to use the terms 'concept' and 'variable' interchangeably. As a general rule, however, the term 'concept' should be used when referring to the connotation of a word (the idea conveyed by the word), and 'variable' when referring to the observable and measurable manifestations of concepts. It is hence more correct to refer to indicators of variables (and not of concepts).

In summary: we have distinguished between two kinds of definition: theoretical definitions that specify the *connotation* of concepts and operational definitions that make the *denotations* of a concept explicit. One could argue that a theoretical definition spells out what is meant or intended by a cer-

tain concept, whereas operational definitions link a concept with certain clearly identifiable 'objects' in the social world. This linkage is established by clearly identifying the valid indicators of the variable.

Strictly speaking, definitions are neither true nor false, only more or less useful. A good definition is one that leads to clear and unambiguous conceptualisations (the role of theoretical definitions) and valid measurement of phenomena (the function of operational definitions). The question of 'truth' or 'falsity' only arises when testable claims are made regarding the actual state of affairs in the social world. This brings us to the next section.

## Elaboration: empirical statements

Empirical statements are sentences which contain demonstrable, testable claims about the world. Such statements make epistemic or knowledge claims. We distinguish between two main types of empirical statements: *descriptive* statements that make factual claims and *explanatory* statements that make explanatory or causal claims. Regarding the latter, Daniel Little has convincingly argued that there are two different although related kinds of explanation: Explanations answer both *how possible* questions and *why-necessary* questions. Let me illustrate the difference between these three kinds of statements (descriptive, how-possible and why-necessary) with reference to a typical murder case. It has incidentally been observed that there are interesting similarities between the role of a detective and that of a social scientist!

We assume that we are dealing with a situation which is an obvious case of murder. Unless the fact of the matter, that is, whether it is really a case of murder (as opposed to suicide or an accident) has been established, no further investigation is required! Let us further assume that we have a prime suspect. The next step is to show that our suspect had the opportunity, means and motive to murder the victim. This translates into three questions:

- Could he have done it? Can we place him at the scene of the murder at the estimated time of the murder?
- How was he supposed to have done it? (A question about the means, for example, did he have a gun at his disposal?)
- Why would he have done it? (A question of motive or reason, for example, was he driven by greed, revenge or any other motive?)

We all know of cases where one or more of these aspects remain unresolved. In some cases the matter of opportunity remains a mystery. Unless it can be proved that the suspect was or could have been at the scene of the murder, no serious case can be made against him. A first step in a murder investigation is hence to link (by whatever evidence – eye witness, traces, forensic evidence) the murderer to the scene of the crime at the appropriate time. The second step is to argue that the suspect had access to the victim and also the necessary means (weapon, poison) to kill the victim. And finally most murderers are assumed to be driven by clear motives – possibly greed or revenge or hatred. This explains why motiveless murders are seen

as such exceptions – the typical cases of sociopathic murderers (the film *The silence of the lamb* is an example).

These three questions are related in interesting ways. Establishing opportunity is usually viewed as a necessary, if not sufficient, condition for indicting someone for murder. This is in fact why the matter of an alibi is such a crucial aspect in any murder investigation. If a suspect produces a watertight alibi, it usually renders the other questions of means and motives academic. This is another way of saying that, unless it can be proved beyond reasonable doubt that the suspect had the opportunity to murder the victim, no amount of argumentation about motives and means will be regarded as sufficient.

The question about 'means' is also seen as a necessary, although perhaps weaker condition to 'tie up the case'. There is an interesting relationship between means and motive. The strongest possible case exists when both motive, such as greed, and means, such as a weapon are tied to the murderer. But there are many examples where it has sufficed to prove only motive. In some cases it is not possible to link the murder weapon to the suspect – it might have been a stolen gun, fingerprints might have been wiped off or the murder weapon might not have been found at the scene of the crime.

A satisfactory account of what happened in a murder investigation should include the following elements:

- First, the *fact* of the suspect's presence at the scene of the crime must be established through the collection of forensic and other evidence to prove opportunity, and a link must be established between the murder suspect and the victim through intensive interviewing and background checking.
- Secondly a *how-possible* explanation is offered in the form of a description of the mechanisms or means of the murder, i.e. an explanation of how the murder could have been committed which, in most cases, is unproblematic.
- Thirdly a *why-necessary* explanation in the form of a description of the motives of the murderer, i.e. an explanation of why it was committed.

In summary: in any homicide investigation we first establish the facts of the matter (What really happened? Is it indeed a case of murder or perhaps merely an accident? What was the relationship between the murderer and the victim? Did the suspect have access to a murder weapon?) This requires 'factual statements' or descriptive knowledge. And it is not uncommon to find that descriptions of what really happened could differ. There might be rival descriptions, stories or conclusions that need to be eliminated through the accumulation of additional evidence.

Once the facts of the case have had been established, we move on to explaining *how* it could have happened and *why* it did happen. Although the *how* explanation is not always essential, a satisfactory account for both types of explanation is regarded as stronger and more convincing.

This brief example illustrates the difference between descriptive knowledge (factual statements) and explanatory statements (statements that

make causal claims about the *how* and *why* of events). This threefold distinction will now be discussed more fully as it pertains to social science.

## Descriptive or factual statements

A descriptive or factual statement makes a claim about what really is the case. There are various kinds of descriptive statements. We can distinguish between types of descriptive statements according to the following dimensions:

- the number of cases covered by a description;
- the number of variables included in a description; and
- the level of measurement.

□ Descriptive statements come in various forms, ranging from singular propositions, like South Africa has a illiteracy rate of forty-five per cent, to general propositions or generalisations, like in all countries the kind of political system is strongly related to the economic system. Descriptions range over any number of cases: from single cases such as a single individual country or company to multiple cases such as comparative studies between twenty nations to large populations that could include thousands of individuals.

□ Descriptions can range over one (univariate) or many (multivariate) characteristics of the unit of analysis. When descriptive statements address one variable at a time, they usually describe the amount or value of that property. An example is a description of attitudes towards the death penalty within one's sample where seventy per cent are in favour, twenty per cent are against and five per cent are uncertain. When statements describe two or more variables, they usually refer to the relationship between them, for instance between intelligence and scholastic achievement (the higher a student's IQ the better he or she will perform at school).

□ Descriptions can be qualitative or quantitative, depending on the level of measurement. In qualitative or nominal measurement we merely count instances and classify them together. Classification underlies the notion of typologies. For example, there are three main classes in society, namely lower class, middle class and upper class, or two main personality types, namely type A and type B personalities, or two value systems, namely materialist and post-materialist. By contrast, correlational descriptions, as opposed to classificatory descriptions, examine the kinds of relationships that can obtain between variables (linear/curvilinear) and express this in a numerical form of some kind, such as correlation coefficients and regression coefficients.

## Explanatory statements

An explanatory statement makes a causal claim. In *Varieties of social explanation,* Daniel Little (1991) makes the valid point that there are four types

of causal claims in social science. The first type is the singular causal judgement, for instance that the assassination of Franz Ferdinand led to the outbreak of World War I. The second is the generic causal relation, for instance that famine causes social disorder. The third is the causal relevance claim, for instance that the level of commercialisation influences the rate of urbanisation. Fourthly there are probabilistic causal claims, for instance that arms races increase the likelihood of war.

Similarly, various kinds of 'entities' in the social world may be invoked as possible causes: for instance individual actions, collective actions, social structures, state activity, forms of organisation, systems of norms and values, cultural modes of representation, social relations and the geographic and ecological features of an environment.

In the social sciences true explanation is all about identifying the causal powers and forces that produce things/events, etcetera. In accordance with the realist interpretation of causality this implies an analysis of the nature or structure of the phenomenon to be explained. It is by virtue of the nature of an entity that it has certain powers (it is because I am human that I have the capacity to think). (For a more detailed discussion of this topic see Mouton, 1994a.) In social science we explain by (re)constructing, the causal mechanisms (in the case of phenomena) or the causal stories (in the case of historical events) that produce certain outcomes. Allow me to refer to an example to clarify the notion of 'causal mechanism' or 'causal story'.

Suppose the practical problem I wish to address is to identify factors that would increase productivity in a typical factory. Suppose further, that through empirical research I have established that high productivity consistently correlates strongly and positively with high levels of job satisfaction. In other words, all things being equal, if I were to increase the job satisfaction of my employees my business' performance would be likely to improve. This is of course typical statistical talk: there is a significant positive correlation between the two variables, namely job satisfaction and productivity.

But we have still not answered the causal question, to wit, through which causal mechanisms or processes can 'higher job satisfaction' lead to 'increased productivity'. Our explanation might well be something along the following lines: people who are more satisfied in their jobs are better motivated to do their best for the business. They would hence tend to work harder than less satisfied workers and therefore produce more.

Note that in cases of explanation it is crucial to specify the explanandum, that which is to be explained, very clearly. In this example, I wished to explain 'increased productivity', the dependent variable and proceeded by postulating 'job satisfaction' as a causal factor. In another situation, I might wish to explain the causes of 'job satisfaction'. Why are some people more satisfied in their jobs than others? For this, we would probably have to turn to a structural analysis of the organisations in which people work – in this case some features of the factories which cause workers to be more satisfied. Presumably these would include factors like optimal size and appropriate organisational structure, management commitment to staff development, a critical mass of technological know-how and inspiring leadership. Again, a theory that purports to explain 'job satisfaction' could read as follows: Companies of the right size, with open communication systems,

sophisticated staff development programmes and inspiring leadership inevitably have more satisfied workers.

In this example there are two points worth mentioning:

- The identification of a regularity (a pattern) in the data (between 'high productivity' and 'job satisfaction') as such does not necessarily explain why certain things are produced or caused and others not, but it does provide us with clues on where to look for possible causes.
- An explanation involves a retroductive inference from the observable (the existence of the regularity) to the possible underlying causative mechanisms or processes (in this case the link between job satisfaction, increased motivation and higher productivity).

This concludes our discussion of explanatory statements in social science. The issue of 'explanation' is also addressed, albeit from a different perspective, in the discussion of the nature of theories in the next chapter.

## Critical reflection and assignment

Choose any reading. Give examples of each of the following:

- A theoretical definition of a key concept of the study.
- An operational definition of that same concept.
- A descriptive statement that forms part of the findings of the study.
- An explanatory statement that is proposed to account for some aspect of the research findings.

# 29

# *Typologies, models and theories*

**Central theme**

Scientific statements do not exist in isolation. When statements are organised according to certain interests or objectives and become integrated into conceptual frameworks, we find the familiar 'structures' of science: typologies, models and theories. Each of these conceptual frameworks fulfils a specific function within the body of knowledge: the classificatory function of typologies, the heuristic function of models and the explanatory function of theories.

Key concepts

Typologies – ideal type – classification – models – heuristic function – theories – causal mechanisms.

## The main argument

It is possible to distinguish between three types of conceptual frameworks:

- *typologies*, which basically have a classifying or categorising function based on single variables;
- *models*, which provide a systematic representation of phenomena by identifying patterns and regularities amongst variables; and
- *theories*, which provide an explanation of phenomena by postulating an underlying causal mechanism.

## Elaboration: typologies

A typology may be defined as a conceptual framework in which phenomena are classified in terms of characteristics that they have in common with other phenomena. Classification is one of the more basic functions of conceptual frameworks. The history of the physical sciences has produced a number of well-known classifications or taxonomies: Mendeleev's classification of the elements, Linnaeus's classification of the different species of animals, and so on.

Similarly, classifications or more accurately, typologies, can be found in every discipline in the social sciences: people are classified as introverts or extroverts, societies as democratic or totalitarian, attitudes as conservative

or progressive, values as materialistic or post-materialistic and literary texts as epic, dramatic or lyrical.

From these examples it is possible to summarise the major characteristics of a typology as follows:

1. The basic unit of a typology is the 'type' or, to employ Weber's terminology, the 'ideal type'. In a description of the typical characteristics of a phenomenon, the common or outstanding characteristic is emphasised and the trivial or incidental ones are eliminated. Obviously the identification of what is typical involves a process of abstraction. Starting with the concrete level of experience we move to a higher level of abstraction in which the common characteristics are emphasised at the expense of whatever is specific.
2. The consequence of abstraction is that no type is ever an exact reproduction of all the characteristics of a phenomenon. Because abstraction involves 'selection', the relationship between the type (construct) and the phenomenon (that is typified) is one of approximation.
3. The criteria of good classification, and for that reason also of typologies, are exhaustiveness and mutual exclusiveness. As far as possible, a given type should include, in a single class, all the possible relevant characteristics that are associated. This is the rule of exhaustiveness. In addition, the different types that comprise the typology should, as far as possible, be mutually exclusive. Any overlap between categories should be eliminated through a process of further refinement.

Typologies fulfil different functions in different types of research. The construction of a typology sometimes constitutes the first step in a process that will ultimately culminate in the systematic collection of data. Typologies, as is the case with all conceptual frameworks, therefore serve as a frame of reference for observation and data collection. This function means that the data-collection process is guided by the typology while the eventual data analysis is also made easier. The typology also provides a framework for data analysis because possible commonalities between phenomena have already been systematised in the typology. Typologies can also serve a limited heuristic function when they lead to the formulation of new hypotheses. The model is, however, the primary conceptual framework with a heuristic function.

## Elaboration: models

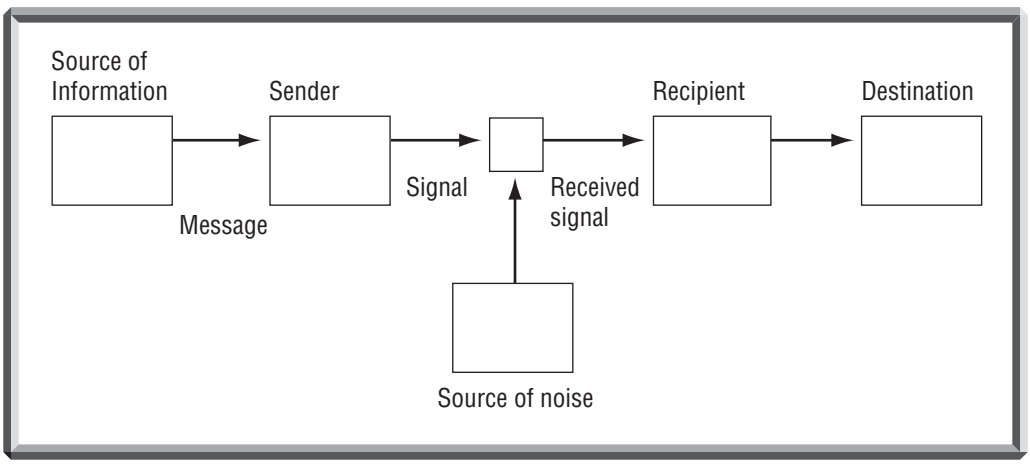
The term 'model' is probably one of the most ambiguous in the vocabulary of the social scientist. It is generally accepted that theories and models bear a number of important similarities (compare Achinstein (1968) and Gorrell (1981)). Both of these authors maintain that the differences between models and theories are largely differences of degree. Although a rigid distinction need not always be drawn between model and theory, the differences between these two constructs will be emphasised here. In the process we shall argue that the heuristic function is the most common characteristic of models, while the explanatory function is usually attributed to theories.

The fundamental relationship between a model and an analogy is discussed by Giere:

> *The use of models in science can be described in general terms as follows. There is a type of system, such as atoms, about which not much is known. However, there are other systems such as solar systems, about which a lot is known. In 1900 there were already good theories of solar systems (e.g. Newton's). Someone then suggests that maybe the unknown type of system is like the known one in certain important respects. This in turn suggests questions that one should ask about the unknown system: How fast are the electrons moving around their orbits? Are the orbits circular or elliptical? and so on. The model also suggests ways of answering the questions … So it is clear that models as the basis of analogies do play an important role in scientific research – that is, in the creation of new theories* (1979:79).

In this case an established theory of the planetary system was used as the source for the construction of a model of the relatively unknown phenomenon of atoms. We encounter the same situation in the social sciences where models of political dynamics such as Easton's systems theory model, or problem-solving models such as Popper's evolutionary theory have their origin in the biological sciences. However, this analogical relationship exists not only between the better-known and the less well-known (the new) model, but also between the model and the real-life phenomena of which it is the model. As indicated by Kaplan (1964:265), this has led to models also being referred to as 'scientific metaphors'. Through a study of a specific phenomenon, the researcher reveals certain similarities or relationships, and systematises these (in a simplified form) as a model of that phenomenon. One could claim that the model is an 'as-if framework' in which a model of X would claim that X is structured in the manner suggested by the model. We can illustrate this 'as-if character' of models very clearly by means of one of the well-known models in the field of communication science, namely Shannon and Weaver's (1948) model of the communication process as set out in figure 29.1.

**Figure 29.1** The communication process



In this model certain aspects of the communication process are highlighted, namely information and the accuracy of information transfer. One of the impediments to reliable communication is known as 'noise', which refers to undesirable signals that have a negative influence on reliability.

If we were to regard this model as typical, we could highlight the differences between it and typologies on the one hand, and theories on the other. As already said, a typology is a conceptual framework in which phenomena are classified in terms of constructs or ideal types. A typology thus presents no more than a static image or a cross-section of a specific class of events, whereas a model is an attempt to represent the dynamic aspects of the phenomenon by illustrating the relationships between its elements in a simplified form. In Shannon and Weaver's model it is not merely a matter of identifying the major elements of the communication process (sender, message, recipient, noise and so on): there is also an effort to specify the relationships between the source of information, the sender, the recipient and the destination.

The key issue to bear in mind when either studying or using models, is that they do not purport to be any more than a partial representation of a given phenomenon. Kaplan quite justifiably maintains that "the model is a particular mode of representation, so that not all its features correspond to some characteristic of its subject matter" (1964:284). It is only in a broad sense that a model agrees with the phenomenon of which it is a model. Certain characteristics of the phenomenon, which are irrelevant to the model, are conveniently excluded, while the most obvious aspects are emphasised. The value of this simplification is that it draws the researcher's attention to specific themes. In Shannon and Weaver's model the issue of the accurate transfer of a message and the role of noise in this process are emphasised. It is this guiding function in models that is referred to as the heuristic function (literally 'heuristic' means to discover or to reveal). The model is hence used to suggest new areas of research because certain relationships and dimensions are highlighted.

## Elaboration: theories

A well-known definition of a theory is offered by Kerlinger:

> *A theory is a set of interrelated constructs (concepts), definitions, and propositions that present a systematic view of phenomena by specifying relations between variables, with the purpose of explaining and predicting the phenomena* (1973:9).

In this definition the specific characteristics of a typology ('set of interrelated constructs') and a model ('specifying relations between variables') can be recognised. In addition to the classifying and heuristic functions of typologies and models, theories can be distinguished as instruments that are also aimed at explaining and predicting phenomena or events.

However, Kerlinger's definition is defective in two senses: firstly in that he provides no clarification of the notion of 'explanation' and secondly because he adheres to what I believe is the outdated notion that social theories should be able to predict future phenomena or events. I shall show

below that social scientists have taken over this notion, quite uncritically, from their natural science colleagues.

I believe that there is growing consensus that what we will refer to as the 'explanatory theories' of the social sciences have a logic of their own, which is quite distinct from explanatory theories in the natural sciences, although there are also some fundamental similarities. Let me list what I would regard as some of the distinctive features of explanatory theories in the social sciences:

- Explanatory theories explain by constructing causal models and stories of phenomena (cf. chapter 28).
- Such causal stories are more or less plausible to the extent that they identify the real causal processes or mechanisms that produce certain states of affairs or events.
- Although such causal stories might invoke empirical regularities (for example, statistical generalisations) they do not necessarily have to take the form of universal or deterministic laws. This implies that explanatory social science theories vary in scope from fairly 'local' explanations to more general 'cross-national' explanatory models.
- Because explanatory theories typically explain phenomena in open systems, prediction is not an essential criterion for theories in the social sciences.

Let me elaborate on some of these aspects, especially since they imply a rejection of the orthodox, positivist notion of theories, a notion which is still widely held in academic departments. What are the core ideas of the positivist notion of social theories? I shall summarise what I believe to be the three key themes or tendencies in the positivist paradigm as borrowed by social scientists. These are:

- the universalistic tendency (the idea of universal theories);
- the formalistic tendency (the idea that theories are axiomatic, deductive propositional systems); and
- the logicist tendency (the idea that the form of social explanation is identical to that of physical explanation).

## The universalistic tendency

Since the seventeenth century, empirical natural science has been viewed as a science that aims to uncover universal truths, i.e. produce lawlike statements (like Newton's universal law of gravitation) that apply to all times and places. In fact, one could argue that the notion of a 'scientific theory' logically implies the idea of 'universality'. For the logical positivist, non-universal or specific theories would make no sense. By definition a theory makes universal claims.

## The formalistic tendency

The idea(l) of theories as universal lawlike statements was linked to the notion of axiomatic systems. In the true mature science, it was believed it

would (or should) be possible to derive all scientific propositions deductively from more general universal laws. At the top of this deductive system the most general theories and laws would be found, together with certain self-evident axioms of nature such as the uniformity of nature and the determinism of natural laws, from which all other scientific propositions follow logically.

## The logicist tendency

Explanation is defined as the primary function of scientific theories. A theory is a formulation of an explanation of phenomena. In natural science, the form of such an explanation was viewed as 'deductive-nomological'. This means that all explanations involve postulating a universal law or theory (the 'nomological' element), which forms the 'explanans' from which one deductively derives the explanandum statement, namely the statement describing the phenomenon to be explained.

The promise of positivism was that scientific disciplines that used this framework as a model would soon achieve true scientific status. In the final analysis, being scientific means being able to formulate true, universal, law-like statements that provide causal explanations of the world.

However, over the past three decades, various criticisms of positivism have led to a rejection of all three these core ideas. The assumption of *universality* is questioned on many grounds. A powerful critique, which can be traced to the Derridean notion of 'differance', emphasises the specificity of social and cultural phenomena. I will refer briefly to a recent article by Craig Calhoun (1992) in which he develops this critique. According to Calhoun, positivist theory is wrong for two reasons: it is neither 'culturally sensitive' nor does it sufficiently appreciate 'historical specificity'.

Regarding 'cultural sensitivity', Calhoun argues that a positivist conception of theory suffers from the enlightenment assumption of 'universal human nature'. In many cases this universalism has led to decontextualised truth claims and ethnocentrism. Calhoun advocates the view that cultural differences should be taken seriously, although not to the point of cultural relativism. He writes: "Empirical social theory which does not fully address cultural and interpersonal difference at the most fundamental levels reinforces the tendency of normative theory to devalue difference" (Calhoun, 1992:250).

One consequence of such an approach is that theories that take differences seriously cannot be purely formal, they must be 'contentful' theories. An appreciation of difference thus leads to rejection of not only the universalising tendency of social theories, but also of the *formalising* tendency. This rejection is further supported by Calhoun's second point: social theories must be historically specific. By this he means three things:

- the production of theories is a historical phenomenon;
- the categories used in theoretical discourse are applicable only to specific historical epochs; and
- theories exist in discursive fields, in relation to other theories, and are not self-sufficient statements of their meaning.

Linda Nicholson is another prominent spokesperson for the rejection of the ideal of 'universal' social theories. According to Nicholson, grand or universal social theory suffers from one serious weakness: key categories within it frequently have ambiguous meanings. This problem is the result of the fact that such a theory has to meet two impossible demands: it must be both general enough to encompass as many social phenomena as possible and specific enough to cover this range non-trivially. She illustrates her point with reference to the Marxian notion of 'production'. The common interpretation of 'production' is that it refers to activities concerned with making food and objects, i.e. its predominant meaning in capitalist societies. But this definition has been challenged, mainly by feminists who argue that it ignores activities commonly performed by women, such as child rearing. In response to this challenge, Marxists then invoke a second reading whereby the term incorporates all activities that are conducive to the reproduction of the human species. But the problem with this reading is that it fails to provide meaningful practical guidance for analysing a society or any form of social change. Her conclusion: "In sum, a tendency of general theory is to move between triviality and ethnocentric projection" (1992:84).

Thus far the discussion has focussed on the first two elements of the positivist promise: the universalising and formalistic tendencies. The third component, the *logicist* tendency, has also come under recent attack from various quarters (Bhaskar, Little, Collins and Turner). Allow me to refer briefly to Jonathan Turner's discussion of this issue.

Turner (1992) specifically addresses the idea that social science theories should emulate natural science in aiming for predictability. In the classic positivist model, the logic of causal explanation and that of prediction is seen as identical. If a universal law is applied to explain current phenomena, the same law can be used to predict future occurrences of the same phenomenon. It is precisely the fact that it is a universal law that enables us to apply it in all time and space contexts.

But the fact of the matter is that the idea of predictability does not apply equally across all natural science disciplines. There are certain disciplines such as meteorology, palaeontology and evolutionary theory, where prediction is impossible. In fact, as Turner also argues, it is clear that prediction is only possible in closed systems, be they naturally closed systems (such as the solar system) or experimentally created closed systems. In other words, prediction is only possible under circumstances where all extraneous forces can be eliminated or alternatively, known and measured. Turner's conclusion: "… most of the time, tests of theories will come in natural empirical systems where many unknown, countervailing and intersecting forces are at work, making precise prediction difficult. Such is often the case in science – geology and earthquake predictions being one example …" (1992:158–9).

Randall Collins advocates a similar argument:

> *Virtually all of the successes of applied natural science have come by constructing closed systems … The ultimate problem with practical sociology is that we cannot build social machines. There are very few physically closed systems in the social world; even formal organisations, which are something*

> *like an effort to build a social machine, typically have major transactions with their environments … I should add that the natural sciences encounter the same problems whenever they try to have practical effects, or even to make good predictions, in their own arenas when these cannot be reduced to closed systems* (1992:190–191).

In summary: in its most fundamental sense, a theory provides an explanation of events or phenomena. Theories explain by way of causal models or stories; by postulating a set of causal mechanisms (a causal process) that account for phenomena like rural poverty or events like the 1976 uprising in Soweto. In this sense, theories vary in scope from very specific explanations, for instance why someone acted in a particular way at a given time, to fairly large-scale general theories like Freud's theory of repression or Marx's theory of alienation. Theories typically vary in scope and hence also in their degree of specificity.

## Critical reflection and assignment

1. Show how Smith and Glanz (reading 3) derive their three hypotheses from the cognitive model of fear of crime.
2. It is the aim of Giorgi's study (reading 1) to test Martin's theory of secularisation empirically. What are the main theses of Martin's theory and what is the main assumption that underlies his theory? Do you think that it is a reasonable assumption?
3. Giorgi argues that Martin's theory of secularisation is superior because it takes account of the socio-historical context in which secularisation takes place. What exactly does she mean and why is this fact relevant to her study?

# 30

# *Social science paradigms*

**Central theme**

Thomas Kuhn coined the phrase 'paradigm' to refer to established research traditions in a particular discipline. In this sense a paradigm in the social sciences will include the accepted theories, models, body of research and methodologies in a particular tradition such as Marxism or psychoanalysis or behaviourism. The 'logic' of paradigms is discussed with reference to concepts such as normal science and scientific revolutions. The chapter concludes with a discussion of the usefulness of the concept of a 'paradigm' in social research.

**Key concepts**

Paradigm – normal science – scientific revolutions – anomalies – crisis.

## The main argument

The origin of the term 'paradigm' in the epistemological sense of the word, is to be found in Thomas Kuhn's book called *The structure of scientific revolution,* 1962. The concept is best understood against the background of the problem that Kuhn addresses, namely the nature of growth and development in the sciences, especially the physical sciences. According to Kuhn, the history of the physical sciences displays a clearly discernible pattern of periods of so-called normal science, followed by scientific revolutions; these are in turn followed by a period of normal science, and so on.

## Elaboration: scientific revolutions

Kuhn maintains that if we look at the history of the physical sciences, it is always possible to identify the theories that can be regarded as the origin of a given science. So Ptolemaios' theory of astronomy, the Aristotelian theory of motion, Newton's theory of optics, Stahl's theory on philology and Darwin's theory of evolution all represent the origins of various disciplines. In the periods preceding the general acceptance of such a theory, we almost invariably find that there were a number of competing theories or points of view. These periods are characterised by dissension as to which of the competing theories ought to be accepted as the correct one. In the field of

optics for instance, before Newton's work in the latter part of the seventeenth century, there were proponents of the theories of Aristotle, Epicures, and Descartes who all claimed that their particular theory could explain the fundamental nature of light.

However, when a specific theory is developed at a given stage and it appears to offer satisfactory solutions to real empirical problems we have, in terms of Kuhn's approach, entered the phase of normal science. While the pre-paradigmatic phase is characterised by lengthy debates that tend to be somewhat metaphysical or philosophical, namely questions concerning the real nature of the phenomena being studied in a given discipline, we find that once the period of normal science has been entered, these fundamental questions are set aside, and specific theoretical or empirical issues are tackled. Normal science is therefore research that is based on certain scientific achievements. These achievements are acknowledged and accepted by a specific scientific community as the basis for further research. Kuhn refers to these achievements as paradigms.

Normal science may thus be defined as the practice of scientific research within and from the frame of reference supplied by a dominant paradigm, that is, from a collection of mutually accepted achievements (including theories, exemplary solutions, predictions and laws). In this sense, a paradigm is primarily a model for conducting normal research. We shall now turn our attention to the different components of a paradigm, and to its most important functions.

Kuhn maintains that, were we to analyse various traditions in the history of science such as Newtonian mechanics and Darwinian biology, we would find that the researchers in those periods made a variety of commitments to components of the paradigm concerned.

- In the first place, scientists commit themselves to a specific theory or law, or to a set of theories or laws. The most obvious and probably the most binding commitment is exemplified by generalisations such as the ones we have just noted. These are explicit statements of scientific law and statements about scientific concepts and theories.
- In the second place, the researcher espouses a given methodology or set of research techniques as dictated by the paradigm. At a level that is lower or more concrete than that of laws and theories, there is a multitude of commitments to preferred types of instrumentation and to the ways in which accepted instruments may legitimately be employed (1970:40).
- In the third place, scientists commit themselves to specific metaphysical assumptions and preconceptions. In this context, Kuhn refers to both the assumptions concerning the research object (that which is to be studied) and the assumptions concerning the manner in which it should be researched (criteria for an acceptable view of science).
- In conclusion, there are certain assumptions that the scientist makes as a scientist. "The scientist must, for example, be concerned to understand the world and to extend the precision and scope with which it has been ordered. That commitment must, in turn, lead him to scrutinise … some aspect of nature in great empirical detail" (1970:41).

Kuhn discusses the network of commitments of each researcher and refers to them as "conceptual, theoretical, instrumental and methodological" commitments.

## Normal science

How does the acceptance of a paradigm enable the research community to conduct normal research? Kuhn's reply: a group of scientists commit themselves to a particular paradigm because they regard that paradigm as the most promising in comparison with other competing paradigms. According to Kuhn, it is for this reason that normal science has to be regarded as an actualisation of that promise. This actualisation is achieved by extending knowledge of the facts that the paradigm displays as particularly revealing, by increasing the extent of the match between those facts and the paradigm's predictions and by further articulation of the paradigm itself (1970:24). In an important sense, normal science may be viewed as a mopping-up operation. This mopping-up operation comprises primarily three functions, all of which may be defined in terms of a major problem-solving task. The functions are:

- establishing appropriate facts;
- matching facts and theory; and
- articulation of the theory.

Regarding the establishment of facts it should be noted that a fruitful paradigm provides clues to identify the empirical and theoretical problems that are appropriate and relevant for further problem-solving activities. The paradigm thus has a selection function because it is used to identify relevant problems. Regarding the match of facts and theory one should note that, during normal science, researchers tend to conduct the type of research by means of which the predictions made under the theory can be verified by the facts. The major task is that of solving the problems that are related to matching theory and facts. Regarding articulation, a good deal of time and attention is spent in articulation and further refinement which includes definition and conceptualisation of the theory or theories of the paradigm.

> *The fundamental aim during normal science is to solve problems. Bringing a normal research problem to a conclusion is achieving the anticipated in a new way, and it requires the solution of all kinds of complex instrumental, conceptual and mathematical puzzles. The scientist who succeeds has proved that he is an expert puzzle solver, and the challenge of the puzzle is an important part of what usually drives him on* (Kuhn, 1970:36).

In previous studies on the history of science, there has been a great deal of emphasis on the sparks of genius that have led to scientific discoveries or on flashes of insight into some theoretical problem. Kuhn, however, emphasises a far more pedestrian aspect of research, namely the long process of trial and error that is involved in the search for solutions. Of course, this does not imply that the researcher is unmotivated. What then challenges him is the conviction that, if only he is skilful enough, he will succeed in solving a puzzle that no one before him has either solved or solved as well (1970:38).

PART

4

In conclusion one may state that normal science is a highly successful and highly cumulative enterprise. During normal science, the researcher does not strive to discover new theories. The researcher's task is rather to solve, to the best of his/her ability, those problems that have already been identified, and to match the existing theory and the facts as closely as possible by further refinement and articulation of that theory. Despite all this, we all know of noteworthy discoveries in the history of virtually every discipline as a result of which the entire history of such a discipline has been changed. Kuhn comments on these radical renewals and discontinuities in history when he deals with scientific revolutions.

## Scientific revolutions

A radical break in the normal course of research has its origins in a growing awareness of the existence of a contradiction or an anomaly, in other words, with the recognition that nature has somehow violated the paradigm-induced expectations that govern normal science. On the discovery of new empirical facts that are either not predicted by the paradigm or are entirely unexpected in terms of paradigmatic expectations, we are confronted by an anomaly. It is only when the paradigm has been adapted to such an extent that the new fact can be accommodated and the unexpected becomes the expected that the anomaly will disappear. Awareness of the existence of an anomaly does not thus necessarily lead to the rejection of a paradigm. Normal research is specifically a process of continuous problem solving. The question is therefore: what distinguishes an anomaly from the normal type of problem with which a researcher is confronted every day? Kuhn's answer is that when the paradigm cannot be adapted to accommodate the particular problem we are probably faced with an anomaly. The same would obviously apply to the situation where theoretical problems generated cannot be accommodated by the paradigm.

Thus when the research community is confronted by insoluble empirical and theoretical problems, and these problems affect the core of the community's commitments to the existing paradigm then, according to Kuhn, we are faced with a crisis within that discipline. In the short term, the crisis situation is usually dealt with by means of a variety of *ad hoc* measures, but in the long run, a crisis invariably results in the rejection of the inadequate paradigm. However, this event, which is known as a scientific revolution, can only take place if an alternative paradigm is available. Once such an alternative becomes available, sections of the research community will reject the existing paradigm in favour of the new one, until it has won majority support. Once this stage has been reached, a phase of normal science has once again been initiated. The whole process may be represented as follows:

*Problems ⇨ anomalies ⇨ crisis ⇨ revolution ⇨ normal science alternative.*

Scientific revolutions may be defined as the discontinuities or non-cumulative episodes in the history of a discipline during which an existing and inadequate paradigm is replaced by a new one. Examples are the rejection of the Ptolemaic system in favour of the Copernican system, the

Aristotelian theory of movement in favour of Galileo's paradigm and subsequently that of Newton, and Stahl's philogistic paradigm in favour of the new paradigm offered by Lavoisier and Priestly.

## Elaboration: paradigms in the social sciences

Kuhn's use of the term paradigm and the supporting theory of paradigms has had a major impact on the philosophy and methodology of the social sciences. During the seventies, following on Kuhn's historical analysis of the physical sciences, there was a veritable flood of studies in which similar meta-analyses of the social sciences were undertaken. Typically, the following questions were addressed: Where are the boundaries between paradigms? Which paradigm is currently the dominant one in a given discipline?

The conclusion was often that a given discipline accommodated a variety of competing paradigms. Among these were structural functionalism, symbolic interactionism, ethnomethodology, systems theory, Marxism and Neo-Marxism. In psychology there are, for instance, psycho-analytic, systems theoretical, behaviourist and phenomenological paradigms. Similarly, one could quote a range of examples from each discipline.

A typical strategy in publications that aim to identify and discuss paradigms in the social sciences is to compare the natural and social sciences using Kuhn's theory of paradigms as a point of departure. Almost inevitably, the conclusion is that the social sciences are still in a pre-paradigmatic phase of development because, as yet, none of these disciplines are dominated by a single paradigm. The conclusion that follows is that all of these disciplines are still in a phase of relative immaturity. We view this strategy as being unacceptable because the concept 'paradigm' is used out of context. Kuhn attaches the concept very strongly to the function of problem solving: a function that has a clear and specific meaning in the natural sciences. Even a fairly superficial study of the traditions and schools in the social sciences would readily indicate that problem solving is not as central an epistemic goal in the social sciences as it is in the natural sciences. Goals such as in-depth understanding, explanation, analysis and interpretation are more common. Quite obviously then, the social sciences will not compare favourably with the natural sciences as long as a typically natural science standard is used as the yardstick for such comparisons. For this reason, the use of the concept 'paradigm' is metaphorical when it is applied to the social sciences as opposed to the situation in the natural sciences.

## Critical reflection and assignment

It was Kuhn himself who referred to the analogy between normal science and building a jigsaw puzzle or filling out a crossword puzzle. Further explication of this analogy reveals what Kuhn had in mind, and it also illustrates the relationship between the paradigm as an embracing framework, and normal science. Just as someone doing a crossword puzzle is constrained by the existing structure (the number of squares) the paradigm, to

all intents and purposes, defines the problem area for the researcher – what he/she should research, and also how it ought to be done. However, as in a crossword puzzle, a good and fruitful paradigm will literally provide clues concerning possible solutions. These clues take the form of model solutions, theoretical predictions and so on. Finally, the ontological, theoretical and methodological commitments of the paradigm also determine what would be regarded as valid solutions. As a crossword puzzle determines the parameters of the solution with no more than five letters across and four letters down, a paradigm determines what may be regarded as acceptable solutions and what may not.

Your assignment is to do a library search of the term 'paradigm' as it is used in your discipline. Then select any article that has been written about the role and function of paradigms in that discipline. Write a short essay summarising the main points of the article that you have chosen.

# APPENDIX

# *Readings*

# READING 1

## *Religious involvement in a secularized society: an empirical confirmation of Martin's general theory of secularization*

LIANA GIORGI

Secularization is a loaded concept, both theoretically and emotionally. It has been used in diverse ways[1] and is rightly referred to as a multidimensional concept.[2] But diversity is not necessarily a bad thing. What confuses and often obstructs the study of secularization is the lack of agreement over its intellectual validity as a scientific notion. Secularization is really a very controversial concept. Some sociologists have actually gone as far as to call for its elimination,[3] while others have claimed it to be largely a myth.[4]

Following Glasner and Martin,[5] I would argue that the intricacy of the notion of secularization lies in (a) the fact that there is a distinction that should be made between religion on the one hand, and what Glasner refers to as 'the religious' on the other, and (b) the wrong view that secularization operates in a socio-historical and cultural vacuum.

That religion, as an identifiable system of beliefs and practices that find expression in and through the institution of the Church,[6] is distinct from the all-too human urge to seek and evolve ideational meaning systems and then endow these with a faith that is very akin to what we usually associate with religious fervour (hence 'the religious'), regardless of whether these explanatory paradigms involve the postulation of a transcendental reality or not,[7] is not only a justifiable and rational distinction to make, but a very useful one too.

The introduction of this distinction between religion and 'the religious' is useful, in that it throws light on much of the sociological literature on secularization and, in particular, the debate over the meaning and validity of the concept. The decline of religion, as a coherent identifiable system of beliefs and practices is usually the point of departure for those who assert the reality of secularization; 'the religious' that of those who argue against it.

Needless to say, the apparent failure to distinguish between 'the religious' and religion is not without reason. Even if 'the religious' is seen as rooted in sociality as it is with Durkheim,[8] it still carries connotations of spirituality and spirituality is the occasion for many confused and confusing

discussions in modern social sciences, in which the impersonal and subjective factors are conflated.

In view of the above argument, it would seem wise to adopt the distinction between religion and 'the religious', and to limit the discussion of secularization to the former. In accordance with this, the aim of the present study is to provide secularization profiles of the ten European countries that participated in the 1981 European Values Survey, through an exploration of indicators that pertain to religious involvement and which can be said to reflect the institutional decline of religion on the interpersonal level,[9] or what has come to be called the 'secularization of consciousness',[10] the process through which an increasing number of individuals come to 'look upon the world and their own lives without the benefit of religious interpretation'.[11]

In adopting this cross-national approach, I also wish to empirically exemplify the cultural constraints on the process of secularization, which as hinted at earlier, often remain unacknowledged, only to contribute to further misunderstanding and misgivings.

In what follows, I first discuss the religious indicators used in the present study. After a brief look at the general social profile of religious involvement in Europe today, as reflected in the 1981 European Values Survey data, I examine the cultural patterns of secularization against Martin's[12] general theory of secularization, the best to-date cultural analysis of the process in question.

## The operationalization of religious indicators

The European Value Survey[13] provides an excellent opportunity for examining secularization profiles of different countries. Unlike most contemporary large-scale international surveys, it devoted a whole questionnaire section to the investigation of religious beliefs and practices. These questions have formed the basis for the construction of the religious indicators used in the present study.

Four indicators are used to investigate religious involvement in modern societies: church attendance, self-assessed religiosity, doctrinal orthodoxy and devotionalism. These indicators pertain mainly to religion as an institution. However, and as will become apparent in the following analysis of the data, the indicators also bear, in part, upon the religious impulse. This is especially the case with self-assessed religiosity.

*Church attendance* is a good indicator of the degree of an individual's religious involvement and her or his willingness to participate in the rites of the church: the symbolic expression of the experience of the sacred.[14] Moreover, the measurement of religious practice is a direct behavioural measure. Notwithstanding that behavioural measures are also open to error and response bias, they assess what people do, and this is valuable information given that, as is repeatedly shown by numerous social psychological studies of attitudes, what people say they feel or think does not accurately, or even adequately, correspond to the way people do behave.[15]

But of course, in the present day and time, when religion has largely retreated to the private sphere, for many people the religious feeling need

**Figure 1** Operationalization of doctrinal orthodoxy index

1. 'Here are two statements which people sometimes make when discussing good and evil. Which one comes to your own point of view?'
   A: There are absolutely clear guidelines about what is good and evil. These always apply to everyone, whatever the circumstances (score = 1).
   B: There can never be clear and absolute guidelines about what is good and evil. What is good and evil depends entirely upon the circumstances at the time (score = 0).
   C: Disagree with both (score = 0).
2. 'These are statements one sometimes hears. With which would you tend to agree?'
   A. There is no *one* true religion but there are basic truths and meaning to be found in all the great religions of the world (score = 0).
   B. There is only one true religion (score = 1).
   C. None of the great religions has any truths to offer (score = 0).
3. 'Which if any of the following do you believe in? God, Life after death, Soul, The devil, Hell, Heaven, Sin' (score: 1 for yes, 0 for no).
4. 'Which of these statements comes closest to your beliefs?'
   A. There is a personal God (score = 1).
   B. There is some sort of spirit or life force (score = 0).
   C. I don't really know what to think (score = 0).
   D. I don't really think there is any sort of spirit, God, or life force (score = 0).

N.B. An alternative 'don't know' response was included for all of the above questions. DK responses were treated as missing data.

not be accompanied by a close attachment to a church. The question of *self-assessed religiosity*, seeks to identify precisely this phenomenon, and hence complement the drawing of the national religious profiles. In the European Values Survey, religiosity was assessed by asking the following question:

> *Independently of whether you go to church or not, would you say you are: a religious person, not a religious person, a convinced atheist, (don't know)*.

**Figure 2** Operationalization of devotionalism

1. 'And how important is God in you life? Please use this card (1–10 card) to indicate: 10 means very important, and 1 means not at all important' (score:1–4 = 1; 5–6 = 2; 7–10 = 3).
2. 'Do you find that you get comfort and strength from religion or not?' (score: 1 for yes, 0 for no).
3. 'Do you take some moments for prayer, meditation or contemplation or something like that?' (score: as above).

N.B. An alternative 'don't know' response was included for all three of the above questions. DK responses were treated as missing data.

READING 1

The doctrinal orthodoxy index takes a step further and tries to establish the basis of this religiosity. Do those who profess to be religious or who regularly attend the church believe in God, in sin, in Heaven, in life after death, etcetera? Do the non-religious or even perhaps the atheists hold any religious beliefs?

The conceptualization of doctrinal orthodoxy (as well as devotionalism) was made following Lenski[16] even though its operationalization is slightly different. Figure 1 lists those questions from the European Values Survey, on the basis of which the scale of doctrinal orthodoxy was constructed.

Similarly, the index of *devotionalism* was constructed using the three questions from the European Values Survey displayed on figure 2. 'Devotionalism' taps the emotional and affective religious involvement of an individual beyond, or in addition to, participation in the ritual life of the church.

## The social profile of religious involvement

Another complicating factor in the study of secularization is its uneven spread both temporally and spatially, within and between societies. Hence, while the secularization thesis (but also that of the secularization of consciousness) is corroborated by existing time series data for the late nineteenth and twentieth centuries, which show a quite clear trend of declining religious involvement in religious institutions,[17] these same data indicate how secularization permeates the social structure differentially.[18] The European Values Survey data confirm the demographic patterns that are usually associated with the secularization thesis, i.e. that religious involvement[19] is stronger (a) in rural areas (r = 0,18); (b) amongst the older respondents (r = 0,15); (c) for women (r = 0,14) and (d) amongst those of a low educational achievement (r = 0,09).

However, there is also cross-national variation in these patterns. Thus for example, women in Holland, Belgium, Ireland and Ulster do not show any higher propensity for religious involvement. Religious involvement in Britain on the other hand is closely linked to social status; this is not the case for the whole of Europe and the rest of the countries of the survey.

This cross-national variation in the social-demographic profile of religious involvement is alerting us already to the fact that secularization is not an automatic process that operates in a vacuum following a preset route. In what follows, the cross-national variation of secularization is examined in more detail. This is done against Martin's general theory of secularization.

## The spiral of secularization: cultural patterns

Martin's general theory is the best cultural analysis of the process of secularization. For this reason, in charting the secularization profiles of the ten European countries of the European Values Survey, I shall use the three theses of Martin's account as my reference point, starting with the first thesis on religious culture and secularization, proceeding with the third thesis on how group identity is mediated through religion, and then returning to the second thesis on the secularization pattern characteristic of Protestant

countries. To the best of my knowledge, this is the first empirical confirmation of Martin's thesis at the cross-sectional level of analysis.

However, given that religious culture will figure prominently in the following discussion, it is relevant to note here briefly the religious make up of the countries in the European Values Survey as this emerges from the answers that respondents gave to a question that asked them to indicate their religious denomination. Table 1 displays the findings for all the countries of the survey.[20]



Martin's general theory of secularization examines secularization in its politico-historical context. While never made explicit, one basic assumption underlying Martin's theory is that both religion, especially through its institutional personification in a church, and the nation-state, confer identity upon individuals, even if the identity conferred is of a qualitatively different kind. Consequently, even though national or group identity can be mediated through religion, in the typical case, once the State becomes the identity nexus of a society, religion or rather the Church will be marginalized, and this affects individual religious involvement.

But there are variations in the way this displacement is brought about, and hence different patterns can be seen to emerge. Martin's general theory of secularization uncovers these patterns by delineating the conditions under which, in various countries, authority and power were transferred from the Church to the State. Within this context, and in true Weberian style, Martin's general theory sets one basic premise: that historical events can and do become crucial in the way societies change and develop; they do so by delimiting the space along which change proceeds: "… at certain crucial periods in their history, societies acquire a particular frame … subsequent events persistently move within the limits of that frame".[21] The most crucial of these historical events for the secularization process is of course the Reformation that fundamentally divided Europe across religious lines, thus challenging the tradition of the infallible Catholic unity and all that it represented.

The importance of the Reformation for secularization has been underscored by many other sociologists of religion. This view actually goes back to Durkheim and Weber. Hence, while it is usually industrialization that is associated with the advent of secularization, as well as the parallel and related phenomenon of urbanization, and the development of the scientific paradigm, it is commonly agreed that the origins of secularization go much further back in time. What Protestantism achieved was to bring to the surface and make conscious ideas that were already planted in the Western religious tradition of Christianity and which were of potential secularization momentum.

Christianity represented, first and foremost, a well integrated, intellectually coherent, and formally organized religious system with a strong sense of historical continuity.[22] By this definition it follows that Christianity is a rational system. Moreover, Christianity was essentially, and from the beginning, an individualistic religion.[23] Of course, the Christian paradigm was dressed in a highly emotive and symbolic language, and it was this that for a long time, held at bay all the secularizing elements. The loss of ritual and symbol that accompanied Protestantism facilitated secularization.[24]

READING

1

**Table 1** The religious make up of the European countries

| | | Cath. (%) | Prot. (%) | Non-conf. (%) | Other (%) | None (%) | N/a (%) | N (%) |
|---|---|---|---|---|---|---|---|---|
| *Catholic country* | France | 71 | 1 | – | 28 | – | – | 1200 |
| | Italy | 93 | – | – | 1 | 6 | – | 1348 |
| | Spain | 90 | – | – | 1 | 9 | – | 2303 |
| | Belgium | 72 | 2 | – | 2 | 15 | 9 | 1140 |
| | Eire | 96 | 2 | – | 2 | – | – | 1200 |
| *Mixed country* | Ulster | 25 | 29 | 41 | 5 | – | – | 298 |
| | Germany | 41 | 48 | – | 1 | 9 | 1 | 1303 |
| | Holland | 32 | 18 | 8 | 4 | 35 | 3 | 1221 |
| *Protestant country* | Britain | 11 | 67 | 7 | 6 | 9 | — | 1167 |
| | Denmark | 1 | 91 | – | 3 | 5 | – | 1182 |

*Notes:*

1. Key to abbreviations: Cath. : Catholic.
   Prot. : Protestant.
   Non-conf. : Non-conformist.
   N/a : No answer.
2. Missing cases = 0,3%.

As Berger notes, very poetically, by effectively narrowing the human relationship to 'the sacred' down to 'the one exceedingly narrow channel' of the Bible, Protestantism served as the 'prelude' to secularization.

> *… with nothing remaining 'in between' a radically transcendent God and a radically immanent human world except this one channel, the sinking of the latter into implausibility left an empirical reality, in which indeed 'God is dead'. This reality then became amenable to the systematic rational penetration, both in thought and in activity, which we associate with modern science and technology.*[25]

To reiterate then, Protestantism has more affinities with the process of secularization than Catholicism. We would then expect to find lower rates of religious involvement in Protestant countries as compared to Catholic countries. This is also precisely what Martin's first thesis (as noted, all in all his theory comprises three main theses) postulates.

## Secularization and religious culture

In his *first thesis* Martin associates Protestantism with individual striving, Catholicism with collective class antagonism. From this perspective, he traces the spiral of secularization in Catholic and Protestant countries. This places secularization in its socio-political context.

In those countries that adopted the Reformation, argues Martin, and hence Protestantism, the formal separation, and effectively the subordination of the Church to the State was smoothly established. In Catholic countries, on the other hand, the Church was forced to oppose any rising

political secular ideology, including the State that personified the secular in all its self-willed power.

Within Catholicism, 'theology and philosophy, politics and religion, crown and church, religious discipline and social control'[26] are 'naturally' and organically united. It is this that renders it hard for Catholicism, as a system of beliefs, either to support political revolutions or assert liberalism and individualism.

Nevertheless, as eventually and inevitably, it slowly begins to subordinate itself to the State, Catholicism ends up aligned with the political right that presents itself as the carrier and sole exponent of religious ideology. This establishes a spiral of secularization in Catholic countries, which veers between the two extremes of religiosity and atheism, where atheism is often identified with communism. In these countries, religion thus becomes a major issue in class conflict, and political conflict in general.[27] Alternatively, in Protestant countries, the Church is subordinate to the State from the start, and hence the cleavage between religion and politics is not as drastic as it is in Catholic countries. This conclusion is borne out by the EVS data.

While religiosity and church attendance are significantly correlated with ideological orientation on the left-right ideological spectrum – assessed by the left-right 10-point scale in all European countries so that atheists and those who hardly attend the Church are more likely to lean to the Left – this effect is stronger in Catholic countries than it is in Protestant countries. However, for the present discussion, the important point is that Protestantism and Catholicism comprise two distinct religious cultures. Does this affect religious involvement? Indeed.

The European Values Survey data also enable us to test Martin's first thesis concerning religious involvement. Table 2 summarises the religious profile of the two large denominations, Catholic and Protestants, as well as that of the non-conformists, the non-affiliators, and people of 'other' religious denominations. The first column lists the percentage of the regular church attenders (once a week or more) in each denomination; the second column the percentage of those professing to be religious; the third column the mean score on the doctrinal orthodoxy scale, and the fourth column the means score on the emotionalism scale.

First a general remark: It is clear from table 2 that religiosity is not confined to those who are regular church attenders or the most ardent devoted believers. In other words religiosity is not confined to those who are probably closer to the life of the Church in general. Moreover, this is especially the case for Protestants and the non-affiliators. What this finding proves is the fact that while the institution of the church may have declined in influence (and this is undoubtedly linked with the modern secularization of consciousness) that alone cannot adequately reflect the state of religion, or more importantly the state of 'the religious', in modern societies, as discussed at the beginning of the article.

Regarding the differences between Catholics and Protestants, as expected, Catholics not only attend church more regularly and profess to be religious in larger numbers than Protestants; they also endorse the religious doctrines to a greater extent than Protestants, and claim a higher degree of devotionalism. However, the non-conformists are probably as religious, if

not more religious than Catholics themselves, despite being Protestants. The non-conformists comprise only a small number of the total sample, coming from the Netherlands, Britain and Northern Ireland, (see table 1), yet it is doubtful that their intense religiosity, as revealed in table 2 is an artefact of poor sampling. Non-conformists are notorious for their militancy and conservatism in religious matters. If non-conformists comprise one extreme, the non-affiliators comprise the other. Among the latter, religious involvement is very low indeed.

**Table 2** Religious profile of main religious groups

| | Regular church attendance (%) | Self-assessed religiosity (%) | Doctrinal orthodoxy | Devotionalism |
|---|---|---|---|---|
| Catholic | 59 (7290) | 78 (6946) | 6,07 (4123) | 3,93 (6376) |
| Protestant | 21 (2861) | 69 (2506) | 4,19 (1303) | 2,97 (2377) |
| Non-conformist | 65 (336) | 73 (321) | 7,45 (208) | 4,08 (290) |
| Non-affiliator | 2 (1186) | 22 (987) | 1,27 (626) | 1,65 (995) |
| Other | 19 (548) | 39 (505) | 3,04 (377) | 2,43 (500) |

*Notes:*

1. Significance levels for all: 0,000.
2. In parentheses the number of cases.
3. Doctrinal orthodoxy measured on a 0–10 point scale. Devotionalism measured on a 1–5 point scale.

So much for the effect of individual religious denomination (or non-adherence to one) on religious involvement. However religion does not operate only on the individual level. The religious denomination of a person is usually indicative of the religious attitude with which that person has been socialized. It is still the case however that there are people socialized in a country where the majority religion is other than their own. In other words, religious culture operates at both a macro and micro level. One can talk about the religious culture of a nation and also about the religious culture of an individual. The question is, which is more important?

Thus in investigating patterns of effect, it is important to control for both individual religious denomination and national majority religious culture. Table 3 compares the religious profiles of the Catholic, mixed and Protestant countries.

The pattern is similar to that for individual religious denominations: in Catholic countries, religious involvement is higher than it is in Protestant countries, especially in terms of church attendance, doctrinal orthodoxy and devotionalism (again the pattern regarding self-assessed religiosity is not as strong). Mixed countries hold the middle position.

The country differences however lack the sharpness of the differences observed for religious denominations on the individual level. And in fact as a two-way analysis of variance (with church attendance as the dependent variable, and individual religious denomination and country religious group as independent variables[28] shows, when taking both the micro and macro levels of religious culture into account, it is the former that produces the strongest main effect.

**Table 3** Religious profiles of country religion

| | Regular church attendance (%) | Self-religiosity (%) | Doctrinal orthodoxy | Devotionalism |
|---|---|---|---|---|
| Catholic | 51 (7213) | 70 (6758) | 5,48 (4167) | 3,65 (6290) |
| Mixed country | 42 (2838) | 69 (2493) | 4,80 (1375) | 3,36 (2264) |
| Protestant country | 17 (2350) | 66 (2099) | 4,10 (1146) | 2,81 (2068) |

*Notes:*

1. Significance levels for all: 0,000.
2. In parentheses the number of cases.
3. Doctrinal orthodoxy measured on a 0–10 point scale.

Table 4 shows the results of the two-way analysis of variance for church attendance.

**Table 4** Two-way analysis of variance: church attendance by individual's religion and country religious group

| | Sum of squares | DF | Mean square | F | Sig F |
|---|---|---|---|---|---|
| *Main effects* | 2401,9 | 6 | 400,3 | 654,0 | 0,000 |
| Country religion | 112,8 | 2 | 56,4 | 92,2 | 0,000 |
| Individual religion | 1814,8 | 4 | 453,7 | 741,2 | 0,000 |
| *Interaction* (2-way) | 150,7 | 8 | 18,8 | 30,8 | 0,000 |
| Explained | 2552,6 | 14 | 182,3 | 297,7 | 0,000 |
| Residual | 7470,9 | 12205 | ,6 | | |
| Total | 100023,5 | 12219 | ,8 | | |

Note:
Missing cases = 1,5%.

The individual effect is eight times larger than the country effect! Therefore what seems to be the case is that the religious involvement exhibited by an individual is predominantly an effect of early socialization and

the religion in which he or she has been reared. To be born a Catholic, in other words, entails a larger probability for adherence to religious institutions than to be born a Protestant, even if living in a predominantly Protestant country.

However, what the above analysis conceals is that where indeed this relationship can be tested, as it can in the mixed Protestant and Catholic countries, Catholics and non-conformists are also minority religions. And according to Martin's third thesis, their active religious involvement is a direct consequence of their minority status.

## The mixed pattern: where Catholics are a minority

Martin's *third thesis* states that politics is not always divorced from religion. In some cases the two are found in an intimate relationship. Religion was once a political force in its own right, in that it constituted an overarching ideological paradigm. With secularization, as already discussed, the demand was raised for a formal separation of powers. But where national, cultural or group identity is at stake, this separation is no longer attainable, and religion enters the modern political arena forcefully. This is precisely the case with Catholicism in the mixed countries.

In both West Germany and the Netherlands (but also Ulster), Catholics were for a long time considered second-class citizens.[29] This rendered Catholicism the active religion in more than one sense, even if in numbers Catholics were clearly in the minority. Furthermore, according to Martin, this situation determines how secularization operates in mixed countries. Briefly, secularization follows a dual path. The cumulative result is one of low practice and low endorsement of belief for the Protestants, and higher religious involvement for the Catholics.

The findings from the European Values Survey show that this is still largely the case, even if in Germany and the Netherlands at least, Catholics are no longer discriminated against. Table 5 summarises the religious profiles of Germany, the Netherlands, Northern Ireland but also Britain (which has both substantive Catholic and non-conformist minorities) overall, and for Catholics, Protestants and others separately.

The Netherlands seems to be the one country where Catholics do not show significantly higher involvement than Protestants. There, it is the non-conformists who are most active in institutionalized religion. This is probably evidence for the loosening of the phenomenon of *verzuiling* or pillarization,[30] so characteristic of the Netherlands.[31] This loosening has contributed largely to the non-affiliation trend which is particularly strong in the Netherlands: 36 per cent of the Dutch say they endorse no denomination; the comparative percentages in other countries are not bigger than 14 per cent (see table 1).

Non-affiliation, in turn, has succeeded in eliminating even the numerical minority of Catholicism (otherwise, discrimination against Catholicism ceased earlier on), a fact that is likely to be related to the levelling off of the differences between mainstream Protestants and Catholics in terms of religious involvement. The same of course cannot be said for the Dutch non-conformists, who still comprise a steady 10 per cent of the population.

**Table 5** Religious profiles of the mixed countries and Britain

| | Church attendance (%) | Self-religiosity (%) | Doctrinal orthodoxy | Devotionalism |
|---|---|---|---|---|
| *West Germany* | 22 | 69 | 4,23 | 3,34 |
| Catholic | 41 | 82 | 5,68 | 3,91 |
| Protestant | 8 | 65 | 3,61 | 3,15 |
| Non-affiliate | 1 | 27 | 1,19 | 1,66 |
| *Holland* | 27 | 70 | 4,33 | 3,17 |
| Catholic | 39 | 93 | 5,08 | 3,89 |
| Protestant | 33 | 92 | 6,30 | 3,86 |
| Non-conformist | 83 | 98 | 8,23 | 4,68 |
| Non-affiliate | 1 | 26 | 1,42 | 1,71 |
| *Ulster* | 53 | 63 | 7,96 | 4,08 |
| Catholic | 93 | 76 | 8,59 | 4,57 |
| Protestant | 29 | 66 | 7,41 | 3,88 |
| Non-conformist | 43 | 56 | 7,97 | 4,00 |
| *Britain* | 14 | 59 | 5,10 | 3,05 |
| Catholic | 41 | 70 | 7,14 | 3,92 |
| Protestant | 7 | 60 | 4,90 | 2,98 |
| Non-conformists | 31 | 73 | 6,23 | 3,63 |
| Non-affiliate | – | 22 | 1,57 | 1,61 |

*Note:*
Significance levels for all: 0,000.

Nevertheless, overall, and with the exception of the Netherlands (and still only for Catholics), Martin's second thesis is empirically validated by the European Values Survey data for the mixed countries. The third thesis also holds true on a more general level. The Republic of Ireland, as well as Northern-Ireland, are both countries where national identity is still to a large degree mediated through religion.

Table 5 exemplifies how true this thesis is for Northern Ireland. Protestants there might be less involved in religion than Catholics, but they are still nevertheless much more religious that Protestants anywhere else. The same is true for Catholics in the Republic of Ireland. Table 6 exemplifies the strong religious profile of both Irelands.

**Table 6** Religious profiles of Eire and Ulster

| | Church attendance (%) | Self-religiosity (%) | Doctrinal orthodoxy | Devotionalism |
|---|---|---|---|---|
| Eire | 82 (1217) | 66 (778) | 7,65 (842) | 4,35 (1146) |
| Ulster | 53 (312) | 63 (187) | 7,96 (199) | 4,08 (284) |

READING

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Despite the obvious strength of religion in both the Republic of Ireland and Northern Ireland, secularization has had its effect in both places. This is borne out by the distancing from religion manifested by the Protestant minority in Northern Ireland, which was noted above (see table 5). It is also borne out by the discrepancy between the percentage of regular church attendance, and the percentage of those who profess to be religious in the Republic of Ireland. This discrepancy suggests that at least for some Irish Catholics, church attendance represents merely an act of conformity to the prevailing social norms, and as such is not an indicator of religiosity.

Unlike the Republic of Ireland and Ulster, religious involvement is very low in both the Protestant countries of the survey, namely, Britain and Denmark. However this observation needs some qualifications.

## The Protestant pattern: Britain and Denmark

Martin's *second thesis* is about the subdivision of the Protestant pattern of the spiral of secularization. It basically states that there are two varieties to the Protestant pattern of secularization: one is that of American pluralism, the other that of the Protestant State Church type. While in the USA the formal separation of the Church from the State allows the Church to adapt to the market mentality and retain a strong public image,[32] in the State Church pattern the existence of an established state church prevents the Church from adapting to the changing times. Hence it limits pluralism and also makes secularization operate differently across class lines.

The two Protestant countries of the European Values Survey, Britain and Denmark, are both of the Protestant State Church type. Consequently, Martin's second thesis cannot be empirically validated. However, what Martin has to say about Britain and Denmark seems to fit the secularization profiles of the two countries evident in the European Values Survey data quite well.

According to Martin, in Britain, the Church and similarly the Crown are not put into question. Due to the association of the Church with the State, religious practice is somewhat limited to the middle and upper classes, but nevertheless, belief is quite prevalent across the whole of British society. In Denmark, on the other hand, religious pluralism, is even more limited (at least in Britain there are Catholic and non-conformist minorities), and the church-class association is quite moderate. As a consequence, religious discourse loses all its salience.

**Table 7** Secularization profiles of Britain and Denmark

| | Church attendance (%) | Religiosity (%) | Doctrinal orthodoxy | Devotionalism |
|---|---|---|---|---|
| Britain | 14 (1168) | 59 (668) | 5.10 (671) | 3.05 (1086) |
| Denmark | 3 (1182) | 74 (717) | 2.65 (475) | 2.45 (982) |

Table 7 contrasts the national religious profiles of Denmark and Britain. As can be seen, in accord with Martin's observations, not only is belief more diffused in Britain, but church attendance rates, as well as devotionalism, are also higher. Moreover, as was noted earlier, Britain is also the only one of the countries of the survey that shows an association between social status and religious involvement. Interesting enough however, more people in Denmark say they are religious than do those in Britain.

## Summary: Cross-national secularization profiles

I have shown above *via* Martin's general theory of secularization and the European Values Survey data, that secularization is itself a process constrained by cultural factors. Table 8 displays how all the European countries fare against the religious indicators in rank order. It proceeds from the country which shows the sharpest religious-traditional profile to that which shows the sharpest secularized profile. Strictly, the table is arranged in order by church attendance. Overall however, the pattern that emerges for church attendance holds for the other religious indicators with the exception of religiosity.

**Table 8** National profiles

| | Church attendance (%) | Religiosity (%) | Doctrinal orthodoxy | Devotionalism |
|---|---|---|---|---|
| Ireland | 82 (1217) | 66 (778) | 7,65 (842) | 4,35 (1146) |
| Ulster | 53 (312) | 63 (187) | 7,96 (199) | 4,08 (284) |
| Spain | 41 (2303) | 65 (1443) | 5,75 (1321) | 3,70 (2001) |
| Italy | 36 (1348) | 86 (1113) | 5,29 (765) | 3,86 (1001) |
| Belgium | 30 (1145) | 81 (786) | 4,70 (490) | 3,54 (838) |
| Holland | 27 (1221) | 70 (776) | 4,33 (641) | 3,17 (1009) |
| Germany | 22 (1305) | 69 (759) | 4,23 (535) | 3,34 (970) |
| Britain | 14 (1168) | 59 (668) | 5,10 (671) | 3,05 (1086) |
| France | 12 (1200) | 56 (617) | 3,39 (749) | 2,70 (1103) |
| Denmark | 3 (1182) | 74 (717) | 2,65 (475) | 2,45 (982) |

Note: In parentheses the number of cases.

Generally the findings support Martin's theory: Catholic countries come at the top of the scale, Protestants at the bottom. Mixed countries take a middle position. However, there are two exceptions: France and Ulster. The case of Ulster has already been discussed in relation to Martin's third thesis. Regarding France, despite being a predominantly Catholic country, religious involvement there is as low as in Denmark, and certainly lower than it is in Britain, which is also a Protestant country.

That France should be the exception among Catholic countries is not surprising. France saw the first real secular Revolution of modern times.[33] This revolution initiated amongst other things, a strong and lengthy tide of anti-clericalism.[34] Moreover, France became the focal point of the Enlightenment and the Renaissance, which has culturally rendered France perhaps the most secularized European nation. It is not an exaggeration to say that there, the secular ideal of the 'free spirit' that seeks the truth in objectivity was born.

## Conclusion

This article has discussed the process of secularization in the ten national cultures of the European Values Survey. It has shown how religious involvement, assessed through four indicators, namely church attendance, self-assessed religiosity, doctrinal orthodoxy and devotionalism varies in degree from one country to the other, in a way that supports Martin's general theory of secularization.

In addition to empirically validating Martin's theory, the findings reported above also justify the claim made earlier in the chapter that, in discussing secularization, a distinction needs to be drawn between religion and 'the religious'. The finding that religious involvement is still stronger in some national cultures than in others, as well as the finding that religiosity is quite prevalent in all countries, despite the institutional decline of religion, shows that the realm of 'the religious' transcends that of religion.

In addition, the following points are worth recalling:

1. Secularization is not an automatic process. It proceeds differentially both within and between societies.
2. Religious culture is a major determinant of secularization. In Catholic countries, Spain, Italy, the Republic of Ireland and Belgium, religious involvement is still maintained strongly despite the institutional decline of religion. In Protestant countries, the decline of the church has been accompanied by a parallel process of secularization of consciousness. In mixed countries, on the other hand, secularization assumes a dual path.
3. The exceptions to the above are France on the one hand, Ulster on the other. In the latter case, religious involvement is strong as a result of the political situation in Northern Ireland which, in a way similar to that of the Republic of Ireland, as well as Catholicism in mixed countries, necessitates the mediation of national identity through religion. Otherwise, historical and other cultural factors have overpowered religious culture in determining the orbit of the spiral of secularization in France.

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11. *Ibid.,* p. 108.
12. Martin, *supra,* note 5.
13. The European Values Survey (EVS) was designed by the European Values System Study Group (EVSSG) with the aim of charting the broad features of values of the European population. The survey was initially carried out in the ten European countries examined in the present context, but was consequently initiated in full or in part in many other countries in Europe and elsewhere in the world. The 1981 Values survey sampled individuals, aiming to obtain representative national samples of adults between the ages of 18 and 65. The sampling procedure followed, combining stratification and random sampling methods, was very similar to the one used in the EEC Eurobarometer surveys. For a more detailed discussion of the credentials of the EVS as a data source for secondary analysis see Giorgi, L. 1990. *Aspects of the subjective culture of modernity.* Unpublished PhD dissertation manuscript. Also for a general overview of the findings from the EVS, see Harding, S.G. et al. 1986. *Contrasting values in Western Europe: unity, diversity and change.* Houndmills: MacMillan.
14. Acquaviva, S.S. 1979 [1966]. *The decline of the sacred in industrial society* (trans. By P. Lipscomb). Oxford: Blackwell.
15. This was brought home to social-psychologists with a study by Wicker on attitudes and actions. Wicker, A.N. Attitudes v. actions: the relationship of verbal and overt responses to attitude objects. In Warren, W. & Jahoda, M. (eds). 1973 [1969]. *Attitudes: selected readings.* 2nd ed. Harmondsworth: Penguin.
16. Lenski, G. 1963 [1961]. *The religious factor: a sociological study of religion's impact on politics, economics and family life.* New York: Anchor.
17. See the studies by Martin, *supra,* note 5; Mol, H. (ed.). 1972. *Western religion: a country by country sociological inquiry.* The Hague, Mouton; Glenn, N.D. 1987. The trend in 'no religion' respondents to U.S. national surveys late 1950s to early 1980s. *Public Opinion Quarterly,* 51: 293–314.
18. Here and in the following discussion, I focus on the spatial aspects of secularization, its social profile and its cultural profile. However, a similar argument can be made temporally. An example of this is the short-lived religious revival of the early twentieth century that parallels, although it runs in the opposite direction, the slump in church practice that historical sources suggest for some period between the twelfth and fourteenth centuries. On the basis of this, Chadwick is right to warn against assuming that ours is historically the only secular society. See Chadwick, O. 1975. *The secularization of the European mind in the nineteenth century.* Cambridge: Cambridge University Press.

19. Correlations reported are for the whole of Europe and specifically church attendance. However, they are representative for both doctrinal orthodoxy and deviationalism, with the exception of education that produces a stronger effect for doctrinal orthodoxy (r = 0,19) and devotionalism (r = 0,17). The socio-demographic profile of self-assessed religiosity on the other hand is not as clear.
20. The following religious denominations were included as possible answers to this question: Catholic, Protestant, Non-conformist, Jew, Muslim, Buddhist, Hindu, Other, None. Concerning table 1, the following two points should be noted: (1) In drawing table 1, I grouped Jews, Muslims, Buddhist, Hindu and Others in the 'Other' category. Overall, the percentage of 'others' in the countries of the survey is small. The exception is France. Unfortunately, there is not much information as to what religious denomination these 'others' actually have in France, since they are neither Jews, Muslims, Buddhists or Hindu. It is possible that some of these 'others' are members of the charismatic cults that are apparently on the rise in France today. Cf. Ardagh, J. 1988. *France today: a new and revised edition of France in the 1980s.* London: Penguin. (2) The 'non-conformists' category includes the non-mainstream Protestants. In effect, this group is comprised by those Protestants in Britain and Ulster who do not adhere to the Anglican Church, as well as the neo-Calvinists in Holland.
21. Martin, *supra,* note 5. p. 15.
22. Berger, *supra,* note 10.
23. This is the view taken by Durkheim. See the relevant discussion in Giddens, A. 1971. *Capitalism and modern social theory: an analysis of the writings of Marx, Durkheim and Max Weber.* Cambridge: University Press.
24. That Christianity was effecting differentiation and secularization from much earlier on also comes out in Skinner's historical analysis of modern political thought. Already close to achieving an integrated philosophical outlook in the writings of the Enlightenment in the eighteenth century, the intellectual and cultural origins of secularization can nevertheless be traced further back, in however an inchoate and yet latent form, in the Renaissance movement of the fifteenth century, and the Italian instance of republicanism and capitalism in the twelfth century. See Skinner, Q. 1978. *The foundations of modern political thought.* Volume 2: *The age of reformation.* Cambridge: University Press.
25. Berger, *supra,* note 10, p. 112–13.
26. Martin, *supra,* note 5, p. 37.
27. Cf. Lipset, S.M. & Rokkan, S. (eds). 1967. *Party systems and voter alignments: cross national perspectives.* New York: The Free Press.
28. The analysis was repeated with each of the other three religious indicators and the results were the same.
29. The reduction of Catholicism to a minority status was instantiated in West Germany with the *Kulturkampf* and in Holland with the later absorbment of the Catholic regions in the national state of the Netherlands. Cf. Kehrer, G. 1972. Germany: Federal Republic and Layendecker, L. 1972. The Netherlands. In: Mol, H. (ed.). *Western religion.* The Hague: Mouton. Also Goudsblom, J. *Dutch society.* New York: Random.
30. Layendecker; Goudsblom, *supra,* note 29. Also, Lijphart, A. 1975 [1968]. *The politics of accommodation: pluralism and democracy in the Netherlands.* 2nd rev. ed. Berkeley, CA: University of California Press.
31. *Verzuiling* is the name given to the process of vertical pluralism along denominational lines characteristic of Dutch society since the second half of the nineteenth century, and for a good part of the twentieth century. *Verzuiling* is associated with the later entry of the Catholic regions into a Protestant Dutch state, and also with the dissent within Protestantism itself from 1892 onwards. A similar process of *verzuiling* occurs in Belgium, but more on the basis of a linguistic divide: the French secularized region as distinct from the religious North Dutch region. Unfortunately, the lack of coding of region in the EVS data prevents us from examining this phenomenon in more detail for Belgium.
32. Bellah, R.N. 1967. Civil religion in America. *Daedalus,* 96: 1–22. Also Luckmann, T. *The invisible religion.* London: MacMillan.
33. Martin, *supra,* note 5. Lipset and Rokkam, *supra,* note 27.
34. Acquaviva, *supra,* note 14; Also cf. Ardagh, J. 1973. *The new France: a society in transition* 1945–1973. Harmondsworth: Penguin (in association with Secker and Warbung).

# READING 2

## *Effort and reward in college: a replication of some puzzling findings*

LESTER HILL, JR.

**Abstract**

This study replicates research by Schuman *et al.* (1985) which found virtually no correlation between study time in college and grades. The research reported here was not originally designed to replicate the study by Schuman *et al.* (1985); nevertheless, in two separate investigations it replicated three of the major patterns revealed in that study: (1) the pattern of a significant positive correlation between class attendance and grades; (2) a significant positive correlation between study time during weekends and grades; and (3) the pattern of no significant correlation between study time during weekdays and grades. The replication of all three of these patterns gives strong support to the surprising findings by Schuman *et al.* (1985) and also raises more doubt about the connection between effort and reward in college and in other areas. More research will be required to explain why the correlation between study time and grades is so unexpectedly low.

According to Lerner's (1965, 1971, 1980) 'just-world hypothesis', people have a need to believe that they live in a just world – a world in which people get what they deserve and deserve what they get. This need seems to be so strong that people tend to ignore or refuse to accept evidence counter to it. Thus in one study, Lerner (1971) found that subjects who observed a person being innocently victimised actually perceived the victim as being less worthy. The reasoning seems to be that if we live in a just world, even apparently innocent victims deserve what they get. In another study by Lerner (1965), subjects knew that only some of the persons working on a task would be paid for their performance, and that those receiving payment would be chosen randomly. Nevertheless, subjects judged the performance of the paid workers as superior to that of the unpaid workers. The reasoning presumably was that the paid workers must have deserved their pay even though they were chosen randomly.

A corollary of the belief in a just world would seem to be that effort leads to reward – people who word hard should be rewarded more than

people who do not. Apparently, this belief is deeply embedded in American culture. According to Williams (1960), two of the more fundamental American values are 'work' and 'achievement and success'. Furthermore these two values seem to be so interconnected that they are difficult to separate. As Williams notes (1960: 419): "In the United States … achievement is still associated with work … Thus, success is not a primary criterion of value in its own right but rather a derivative reward for active, instrumental performance."

Is it true, however, that effort does lead to reward? Does hard work pay? Is seems clear that some variations of the belief in a just world are not true. For example, victims do not always deserve their treatment. But what about the cherished American belief in the value of hard work? Will this belief hold up under empirical scrutiny? Actually, there seem to have been few, if any, direct attempts to test empirically the link between hard work (effort) and reward. As Schuman, Walsh, Olson, and Etheridge (1985: 946) note, however, sociological studies of occupational and social mobility have rather consistently shown the importance of non-effort factors, such as race, sex, family background, and even luck, in the pursuit of economic rewards (see e.g. Blau & Duncan, 1967; Featherman & Hauser, 1978; and Jencks *et al.,* 1972 and 1979). Studies such as these seem to call into question the linkage between effort and reward, but the evidence is somewhat indirect.

Schuman *et al.* (1985: 946) tell us however that there is one area where the belief that 'effort leads to reward' is so strong as to be practically taken for granted, and that is in academia. There seems to be a common belief that the university is a meritocracy and that people in a university, especially students, get what they deserve. In particular, there is widespread belief that effort (specifically the amount of study time) has a very strong impact on reward (grades received) (see Pantages & Creedon, 1978; Hart & Keller, 1980; and Schuman *et al.,* 1985).

## The Schuman et al. study of effort and reward

A recent study by Schuman *et al.* (1985) raises some serious questions about the connection between effort and reward in college.

In a series of investigations with effort operationalized as study time measured in various ways, Schuman *et al.* (1985) could find no significant correlation between studying (effort) and college grades (reward), with the exception of a small correlation between study time on the weekends and grades. The study was conducted at the University of Michigan and consisted of:

> *four different major investigations and several minor ones over a decade, none of which was successful in yielding the hypothesized association (between total study time and gradepoint average) despite varying attacks on the difficult problem of assessing quantity of study, the somewhat easier problem of assessing grades, and further problems of taking into account other possible variables, such as academic aptitude, that might prevent discovery of a true relationship* (1985: 947).

The four major investigations conducted by Schuman *et al.* (1985) were (1) a study of the relationship between general study time and grade point average (GPA); (2) a study of the relationship between study time and grades for a specific course; (3) a study of the relationship between an 'unobtrusive' measure of study time and grades; and (4) a study of the relationship between 'cumulative measures' of study time and grades.

In the first investigation, a systematic random sample of 522 students (later reduced to 424) was drawn from the Literature, Science, and Arts College at the University of Michigan. The major focus of this investigation was to develop an 'Hours Studied Index'. An earlier study had indicated essentially no correlation between study time and GPA. The researchers assumed, however, that the correlation was in error and that some of the key variables, in particular study time, had been inadequately measured, thus the focus on an 'Hours Studied Index'. The first investigation, however, found only a weak association between study time and GPA (r = ,111), and there does not seem to be any explanation as to why the correlation is so weak. For example, it does not appear that aptitude or ability is a confounding variable. Schuman *et al.* (1985: 950) found virtually no correlation between TSAT scores and Hours Studied. This finding seems to negate the argument that high aptitude students study less than low aptitude students and still make higher grades. Schuman *et al.* (1985: 949) also found that controlling for course load did not affect the correlation between GPA and Hours Studied. Another finding in this investigation that surprised the researchers was the relatively strong correlation (r = ,276) between class attendance and GPA. Class attendance was a much better predictor of GPA than was study time.

In the second major investigation, Schuman *et al.* (1985) examined the association between study time and grades in a specific course, Organic Chemistry. The results in this study were even more disappointing to the researchers. In their own words: "… none of the four measures of studying shows a significant association with any of the three types of grades, although all the correlations are in a positive direction" (Schuman *et al.*, 1985: 955). This second investigation also found a stronger association between attendance and grades (r's from ,21 to ,35) than between study time and grades. In addition, this second investigation revealed a pattern of higher correlations between study time during weekends and grades than between study during weekdays and grades. The authors conclude, however, that the "… data for this single class provide even less evidence than the larger survey that quantity of studying has any appreciable affect on achievement as measure by grades" (Schuman *et al.:* 955).

In the third major investigation, Schuman *et al.* (1985) attempted to measure study time by asking the students in this sample (N = 273) to provide a time chart of all their activities for the day before the interview. Again, the results were disappointing. In the words of the investigators, "The Investigation III measures of Hours Studied shows no correlation at all with GPA for the total sample (r = -,02), nor for the subsample of those who regarded their studying for the day as typical (r = -,03)" (Schuman *et al.:* 957).

The fourth major investigation by Schuman *et al.* (1985) was just as

fruitless as the first three in detecting a strong relationship between study time and GPA. Even though in this investigation study time was measured over an extended period of time, "the primary conclusion from this panel study is that GPA is not significantly predicted from hours studied 'yesterday' at any of three time points, nor from any combination, including the average of all three (r = -,05)" (Shuman *et al.,* 1985: 958). This investigation supported the findings of the first three in another way. There was a strong negative correlation between GPA and reports of the average number of classes missed per week during the term (r = ,46).

Finally, in a series of other investigations from 1979 to 1984, Schuman *et al.* (1985) separated weekend study from weekday study and found a very interesting pattern. With one exception, which may be a chance deviation, the correlations between weekend study and GPA were larger, more significant, and more consistent.

In summary, the Schuman *et al.* (1985) study found virtually no correlation between study time during the weekdays and GPA, a moderate but consistent correlation between study time during weekends and GPA, and a strong correlation between class attendance (or absences) and GPA. Although the association between attendance and GPA is not unexpected, the size of the correlation relative to that between study time and GPA is a surprise, as is the fact that study time on the weekend seems to be more important than study time during weekdays. Furthermore, the almost nonexistent correlation between total study time and GPA runs counter to the widespread belief in the importance of study in college. In the words of Schuman *et al.* (1985: 962):

> *A number of listeners to these results have found them to be so inconsistent with their own intuition that they have simply assumed that some important aspect of studying has been omitted in our research.*

## The replication: first investigation

Are these findings to be trusted? Are they simply a fluke, or can they be replicated at other universities in other populations? Purely by chance, this researcher replicated some aspects of the study by Schuman *et al.* (1985). When the article by Schuman *et al.* (1985) was first published, this researcher had just finished collecting data for a preliminary investigation focusing on factors affecting GPA. A major purpose of the investigation was to pretest a questionnaire that had been designed to be used in a larger, university-wide survey. No major problems were detected with regard to the questionnaire, although the wording of some of the questions was later changed (discussed below).

### Method

In Spring semester 1985, students in three sections of Introduction to Sociology taught by this researcher were administered a questionnaire containing several items about study time, in addition to various kinds of other items. Of the total of seventy-three students enrolled in the three sections (excluding those who had dropped or had stopped attending) sixty students

were present and took part in the survey. Participation was voluntary and no-one refused to participate. At the end of the semester the following information was added to the questionnaire responses for each student: (1) the semester grade in the sociology course (SYGRADE), (2) the score on the first exam in the course (EXAM 1), (3) the score on the comprehensive final in the course (FINAL), and (4) the total number of absences recorded for the student for the semester in the sociology course (ABSENCES). Correlations (r's) were then calculated between relevant variables.

**Table 1** Intercorrelations (r) among GPA and predictor variables for three sections of Introduction to Sociology

| | (1) | (2) | (3)[b] | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| GPA (1) | – | ,45*** | ,65*** | ,72*** | ,70*** | –,00 | ,30** | -,39** |
| HSGPA (2) | | – | ,52*** | ,32*** | ,37*** | ,06 | ,16 | -,01 |
| SYGRADE[b](3) | | | – | ,86*** | ,81*** | ,02 | ,29* | -,50*** |
| FINAL (4) | | | | – | ,83*** | –,11 | ,31* | -,51*** |
| EXAM1 (5) | | | | | – | –,13 | ,26* | -,37** |
| STUDYDAY (6) | | | | | | – | ,17 | -,01 |
| STUDYEND (7) | | | | | | | – | -,00 |
| ABSENCES (8) | | | | | | | | – |

[a] Abbreviations: GPA = reported overall college Grade Point Average.
HSGPA = reported High School Grade Average.
SYGRADE = semester grade in Sociology course.
FINAL = score on comprehensive Final in Sociology.
EXAM1 = score on first exam in Sociology.
STUDYDAY = estimated average number of hours studied during weekdays.
STUDYEND = estimated average number of hours studied on weekends.
ABSENCES = actual number of absences in the Sociology course.

[b] Correlations involving SYGRADE are based on N = 58; Correlations involving FINAL on N = 55; All other correlations based on N = 60.

*,05 level of significance; **,010 level of significance; ***,001 level of significance.

## Results

The most important correlations resulting from this first investigation are presented in table 1. Table 1 reveals that three major patterns found in the study by Schuman *et al.* (1985) were replicated in this investigation. First, ABSENCES (actual number of absences recorded for the semester in Introduction to Sociology) were correlated with four different measures of college grades: (1) GPA = self-reported overall college grade point average (neither actual GPA nor ACT scores were available for this study); (2) SYGRADE = actual semester grade received in Introduction to Sociology; (3) FINAL = actual score on the comprehensive final Introduction to Sociology; and (4) EXAM1 = actual score made on the first major exam in Introduction to Sociology. In each case there was a significant negative correlation between ABSENCES and measures of college grades with r's ranging from -,37 to -,51. (Compare with figure 2 and table 2 in Schuman *et al.*, 1985).

READING

2

The second major pattern that was replicated was the significant positive correlation between study time on the weekend (STUDYEND = self-reported average number of hours of study on weekends) and all four measures of college grades (cf. table 4 in Schuman *et al.,* 1985). Study time on weekends is significantly correlated with GPA, with SYGRADE, with FINAL, and with EXAM1. The correlations average almost ,30 as compared with ,15 for the study by Schuman *et al.* (1985).

Finally study time over weekdays (STUDYDAY = self-reported average number of hours studied per day on a weekday) is not significantly related to any of the measures of college grades. In fact, two of the correlations (those for EXAM1 and FINAL) are negative, although not significant. Thus the puzzling absence of a significant correlation between study time during the weekdays and college grades is replicated at a different university, in a different population, and within a different specific course.

## The replication: second investigation

Even after the results of the study by Schuman *et al.* (1985) had been replicated, this researcher was still sceptical. Would the same patterns still emerge in the larger, representative survey that was planned for the next semester?

### Method

The survey conducted in January 1986 consisted of a systematic random sample (N = 335) of the students enrolled for the Spring semester in a small state university (population size approximately 7000) with an open admissions policy. Some of the questions in the questionnaire used for this investigation were reworded to make them more appropriate for this investigation. For example, instead of requesting the student's average GPA, the question asked for the student's GPA for the previous semester. (Actual GPA and ACT scores were not available for this study.) This change was accompanied by three other changes. The student was asked to report his/her average study time for weekends for the previous semester, the average study time for weekends for the previous semester, and was asked to estimate his/her number of absences for the previous semester separately for classes on Mondays, Wednesdays, Fridays, and for classes on Tuesdays and Thursdays. These absences were later combined to form a score for the total number of estimated absences for the previous semester (ABSENT). The interpretation of the correlations to be discussed is made more accurate if these changes are kept in mind.

### Results

The correlations of major interest from the second investigation are presented in table 2. Inspection of table 2 reveals the duplication of the same three patterns in the study by Schuman *et al.* (1985) that were also duplicated in the first investigation discussed above. First of all, absences (ABSENT = total number of absences for the previous semester as estim-

ated by the student) are significantly negatively correlated with GPA (for the previous semester as reported by the student (r = -,29). Second, there is a significant positive correlation between study time during the weekend (STUDYEND = student's estimate of the average number of hours studied on weekends for the previous semester) and GPA (r = ,19). Finally, study time during the weekdays (STUDYDAY = student's estimate of the average number of hours studied during weekdays for the previous semester) is not significantly related to GPA, although the correlation is in the excepted direction.

**Table 2** Intercorrelations among GPA and predictor variables (1986)[a]

| | GPA | HSGPA | STUDYDAY | STUDYEND | ABSENT |
|---|---|---|---|---|---|
| GPA | – | ,45* | ,09 | ,19* | –,29* |
| HSGPA | | – | ,05 | –,01 | –,21* |
| STUDYDAY | | | – | ,52* | –,25* |
| STUDYEND | | | | – | –,27* |
| ABSENT | | | | | – |

[a] Abbreviations:
GPA = Reported overall college Grade Point Average for the previous semester.
HSGPA = reported High School Grade Average.
STUDYDAY = estimated average number of hours studied during weekdays the previous semester.
STUDYEND = estimated average number of hours studied during the previous semester on weekends.
ABSENT = reported number of absences for previous semester as reported by the student
N = 335 for all correlations.

*0,001 level of significance.

## Discussion

Learner (1965, 1971, and 1980) has shown us that people seem to have a need to believe that they live in a just-world, a world in which people get what they deserve and deserve what they get. A corollary of this just-world hypothesis is that hard work (effort) pays (leads to rewards). However, is the belief in the importance of hard work empirically justified? A study by Schuman *et al.* (1985) produced results regarding the connection between effort and reward in college that are difficult to accept. With the exception of a small but consistent correlation between study time on weekends and grades, study time appeared to be virtually unrelated to grades in college. This finding runs so much counter to traditional belief that even the authors admitted that the "results … leave a certain amount of disbelief among the investigators themselves" (Shuman *et al.:* 947). They are left wondering if "the formal reward system known as grading (is) influenced to an important degree by effort and industry" (p. 963).

There seem to be two very different views that one can take regarding the findings of Schuman *et al.* (1985). The first is to assume that the low or non-existent correlation between study time and college grades is a fluke or aberration, one that cannot be reproduced. This view, however, now seems

untenable since the results have been replicated in the study reported here. In fact, this study replicated three of the major patterns found in the study by Schuman *et al.* (1985). Furthermore, these patterns were replicated in two separate investigations, and in a very different university with a very different population of students.

The second view that can be taken concerning these findings is that the low or non-existent correlation between study time and grades is real. The task then becomes to explain why the correlation is so unexpectedly low. Schuman *et al.* (1985: 962) offer three possible explanations:

1. Study time is very unstable and difficult to measure and they did not succeed in measuring it accurately.
2. Study time really does not affect grades significantly because the student can learn everything necessary to make a good grade by merely attending in class.
3. The separation of ability and effort is incomplete. Factors such as memory and ability to concentrate may be more important than sheer amount of study.

The first of these three explanations does not appear to be satisfactory. First, Schuman *et al.* (1985) tried various ways to measure study time, but there was virtually no change in the correlations between study time and grades. Second, if study time is so unstable and difficult to measure, then the patterns detected in the Schuman *et al.* (1985) study should not have been replicated in this completely independent study. Finally, this explanation would leave unanswered the question as to why study time on weekends is correlated with grades, but study time during week days is not.

The second explanation appears to be more plausible especially if the ability of the student is considered. In fact, one reviewer of an earlier version of this paper maintained that the low correlation between study time and grades should not have been a surprise. In his words, "Those who are smarter need to study less to do better. Dumber need to study more to do as well." This explanation is very reasonable, but it does not seem to fit the data contained in the study by Schuman *et al.* (1985). If ability (IQ) is the primary independent variable which explains the low correlation between study and GPA, then there should be a significant negative correlation between ability (IQ) and study time. Schuman *et al.* (1985: 950) found virtually no correlation between TSAT scores (at least a crude measure of ability/IQ) and study time (r = -,05). However, more intelligent people may get more out of the same study time.

Although measures of ability such as SAT or ACT scores were not available for this replication, the scatter plots do not reveal the clustering that would be expected if high ability respondents studied less and made high grades and low ability respondents studied more and received lower grades. However, of the 52 respondents from the second investigation (N - 335) who reported an 'A' average for the previous semester, 14 reported studying an hour or less per day, and 16 reported studying four hours or more per day. Conversely, of the 27 persons reporting less than a 'C' average for the previous semester, 15 reported studying an hour or less per day, and

four reported studying five or more hours per day. Inspection of the range of scores for study during the week is equivocal in support of the 'smart people need to study less' hypothesis. The 23 respondents who reported studying less than an hour per day had an average GPA (on a five point scale) of 3,1 (s.d. = 1,36), whereas the 24 respondents who reported studying over five hours per day had an average GPA of 3,4 (s.d. = 1,18).

Some variation of the third explanation offered by Schumann *et al.* (1985) may help to clarify these findings. Basically, what is suggested is that the relationship between studying and grades is confounded by other variables. Ability is obviously one variable that must be looked at more closely. There is at least one other variable, however, that must also be studied and that is motivation. As one reviewer noted, study on weekends is an indirect indication of motivation to succeed academically. It would seem then that grades are determined by some combination of at least three major factors – ability, motivation, and effort. Effort will not be put forth if there is not some minimal level of motivation. Even if effort is exerted, however, the results will almost certainly vary for individual students. Two students studying the same material for the same amount of time will almost certainly not absorb the same amount of information for a variety of reasons, most notably differences in ability. With these ideas in mind, this researcher has already begun a study to investigate the relationship between effort, ability, motivation and grades.

Perhaps future research will reveal that when confounding variables are controlled effort is more strongly linked to reward than is indicated in this study and in the one by Schuman *et al.* (1985). Until then, the belief in a just world will still be based more on faith than on evidence.

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# READING 3

# *Fear of crime among the South African public*

KEITH SMITH AND LORRAINE GLANZ

**Abstract**

Fear of crime is recognized as one of the more adverse social and psychological consequences of crime leading to anxiety, mistrust, and a disruption of community and social life. Previous studies have found high levels of fear of crime among the South African public but little is known about the factors contributing to these high levels of fear. In this study a multivariate technique was used to analyse data relating to fear of crime in South Africa. The data were obtained from nationwide surveys for whites, coloureds, and Indians while the black survey was restricted to the PWV area. The personal characteristics of age and sex, as well as area of residence (city or town), were found to be unimportant in explaining fear of crime. The most important predictors were socioeconomic status, perceived seriousness of crime in the community, and experience of victimization. In addition important differences were found between the subsamples and this is explained in terms of neighbourhood differences. The findings indicate support for the cognitive model of fear of crime in which fear of crime is seen as a rational response to a perceived threat.

Vrees vir misdaad word erken as een van die ongunstiger sosiale en sielkundige gevolge van misdaad en dit lei tot angs, wantroue, en die ontwrigting van die sosiale en gemeenskapslewe. In vorige ondersoeke is hoë vlakke van vrees vir misdaad by die Suid-Afrikaanse publiek waargeneem, maar min inligting is beskikbaar oor die faktore wat tot hierdie hoë vlakke van vrees bydra. In hierdie ondersoek is 'n meerveranderlike tegniek gebruik om die data te ontleed wat op vrees vir misdaad in Suid-Afrika betrekking het. Die inligting is verkry tydens landwye opnames onder blankes, kleurlinge, en Indiërs, terwyl die opname onder swartes slegs in die PWV-gebied geloods is. Daar is gevind dat sowel persoonlike eienskappe soos ouderdom en geslag as die woongebied (stad of dorp) van weinig belang is by die verklaring van vrees vir misdaad. Die belangrikste voorspellers was sosioekonomiese status, waargenome erns van misdaad in die gemeenskap, en ervaring van viktimisasie. Belangrike verskille is ook gevind tussen die substeekproewe, wat aan die hand van buurtverskille verklaar word. Die bevindings steun die kognitiewe model van vrees vir misdaad, waarvolgens hierdie vrees 'n rasionele reaksie op 'n waargenome bedreiging is.

## Introduction

Fear of crime, particularly in large urban areas, is a well-documented crime-related problem (Baumer, 1985). In many parts of the western world fear of crime has become a major social and policy issue (Lewis & Maxfield, 1980). In the USA, for example, in reaction to the considerable increase in crime experienced during the 1960s, the public began to demand greater relief for those threatened by crime. Consequently the attention of academics, researchers, and policy makers shifted from the offender and the offence to the direct and indirect victim of crime. The impact of crime at the community and individual level became the focus of research endeavours (Lewis & Salem, 1986).

Experts claim that fear of crime has a crippling effect on the quality of life of city dwellers. It has become generally recognized that the financial cost of crime is far less than the toll taken by the social and psychological consequences of indirect victimization (Conklin, 1975). According to Clemente and Kleiman the cost of crime

> … *extends to the forced alteration of daily living habits as well as to the negative psychological effects of living in a state of constant anxiety* (1979: 520).

The consequences of fear of crime are numerous and take on various forms. The effects can be psychological, for example feelings of anxiety and general mistrust and suspicion. In addition fear can lead to avoidance behaviour, for example when normal activities are curtailed and certain areas are avoided. Garofalo (1979) found a direct relation between limiting one's social life and fear of crime. Another consequence of fear of crime is the often extensive protective measures adopted to reduce the risk of victimization, such as the installation of burglar alarms and the purchasing of firearms. City dwellers in particular have changed their life-styles in order to protect themselves from crime (Brooks, 1974). Lewis and Salem conclude that "… the fear of crime [has become] as much of a social problem as the crime itself" (1986: 3). An exacerbating factor is the phenomenon that fear of crime tends to rise with an increase in crime but does not fall when crime rates fall – at least not at the same rate (Taylor & Hale, 1986).

Past research conducted in South Africa has revealed that various sectors of the population are considerably fearful of crime (Schurink, 1978; Schurink, 1979; Lötter, n.d.). Forty per cent of coloured, 22% of Indian, and 7% of white South Africans have reported in the past that their neighbourhoods are 'very unsafe', while a further 23% of coloureds, 26% of Indians, and 25% of whites regard their neighbourhoods as 'somewhat unsafe' (Lötter, n.d.). It is not clear what factors are associated with, or contribute to, fear of crime on the part of the South African public. In this article this issue will be addressed. Insights gained in this regard could help in the formulation of guide-lines for fear-reduction programmes.

## Theoretical perspective

Since the mid-1960s fear of crime has come to be recognized as an issue separate from crime itself. This occurred after research had established

that the level of fear in a community generally does not match the actual amount of crime in that community. Many more people fear crime than are actually victimized. In a discussion of this anomaly Brooks explains that

> … *generally held perceptions of reality can be at least as important as reality itself in the way they influence a person assessing his own well-being* (1974: 242–3).

Taylor and Hale (1986) suggest that there is a 'multiplier' that spreads the impact of crime.

What do we know about those who fear crime the most? Schurink (1978) succinctly points out that most people fear crime, but they do not do so to the same extent. Personal characteristics such as age and sex have been shown to be related to fear of crime (Baumer, 1985; Garofalo, 1979; Silverman & Kennedy, 1985). Such characteristics appear to be related to feelings of vulnerability. Baumer notes that "… overall fear is a response to subjectively defined risk and personal vulnerability" (1985: 251). Skogan and Maxfield (1981) found that in cities in the USA, females, the poor, blacks, and the elderly have the greatest fear of crime. It has been suggested that fear at the individual level is largely determined by the individual's position in society (Taylor & Hale, 1986).

During the past 20 years researchers have developed a number of theoretical models to explain fear of crime. Of these, the irrational model and the cognitive model are the most widely accepted.

## Irrational model

One group of researchers (Du Bow, McCabe & Kaplan, 1979; Rifai, 1982; Skogan, 1987) consider fear of crime to be an irrational response to a perceived situation. Early research findings indicated that fear of crime is disproportional to the actual risk of victimization. In particular the sectors of the population that were least at risk (such as women and the elderly) were found to be most fearful of crime (Liska, Lawrence & Sanchirico, 1982). This was also shown to be true in the South African context. Strijdom and Schurink (1977) found that out of a group of 432 victims, victims in the age category 40–59 had the highest level of fear, but had a relatively low victimization rate. The irrational model has received further support from more recent overseas research which has failed to produce more than a weak relation between fear of crime and self-reported victimization (Skogan, 1987). It has been suggested that the high level of fear in certain sectors of the population may lead to avoidance behaviour and consequently reduced exposure to risk. This could be one reason for the weak relation between victimization and fear.

Brooks considers fear of crime to be closely related to xenophobia, or fear of strangers. He points out that urban dwellers are daily subjected to a far greater extent to the threat of personal injury from accidental sources than to the threat of injury from crime. Yet people often fear crime but seldom fear accidents. He argues that

> *the man in the street is most afraid of being victimized by a criminal stranger. … Since this attitude is not completely rational, it cannot be neutralized completely by rational rebuttals. It remains a force to contend with* (1974: 242).

According to the irrational perspective, therefore, reducing the actual amount of crime present in a society will not automatically be followed by a reduction in the levels of fear. Proponents of this view contend that, because of its irrational nature, reducing fear may be more difficult to achieve than reducing crime itself.

## Cognitive model

In contrast with the irrational model it is proposed in the cognitive model that fear of crime is a "… rational response to a perceived threat of harm" (Baumer, 1985: 241).

According to followers of this perspective, crime is perceived as a greater threat by those who are physically or socially vulnerable than by the rest of society.[1] The concept of vulnerability is thus used to explain research findings that women, the elderly, and the poor are more fearful. However, Maxfield (1984) found that being elderly or a woman is not the most important determinant of physical vulnerability – perceptions of crime as a serious social problem emerge as a more significant measure of physical vulnerability in explaining fear of crime.

Research has indicated that social vulnerability is also related to fear of crime. Social vulnerability refers to circumstances, such as being poor, that make it difficult to prevent victimization. The poor are often forced to live in areas with a high crime rate and generally do not have the resources to protect themselves from crime. They also have a reduced capacity to recover from victimization (Jaycox, 1978).

Past victimization experiences are seen in the cognitive model as contributing directly to fear of crime. Early research failed to identify such a relation. In more recent research endeavours, however, victims were found to be more fearful than non-victims (Baumer, 1985: Skogan, 1987). This fear tends to spread to friends – research subjects with friends who have been victimized are more fearful than those who do not have such friends. From a panel study, during which subjects were interviewed on two different occasions, it was shown that those who had been victimized were more worried about being a victim again, perceived more crime in the community, and took greater protective measures against crime than those who had not been victimized (Skogan, 1987). Giles-Sims (1984) found that recent victimization significantly predicted level of fear of crime.

It is evident that the research undertaken to date has generally produced conflicting results. The origins of fear remain largely undetected and unconfirmed. It would appear, therefore, that the subject of fear of crime as an area of criminological study warrants greater attention by researchers – particularly in view of the negative effect such fear has on the lives of those experiencing it. In this study the issue of fear of crime was investigated in the South African context.

READING

3

## Aim of the study

The influence of (1) certain personal characteristics; (2) perceptions of the seriousness of crime in the community,[2] and (3) the victimization experience on fear of crime among the South African public was examined. The cognitive model was therefore used as the basis for the formulation of hypotheses. It was hypothesized that females, urban residents, the elderly, and those with low socio-economic status (as measured by educational level) would, because of their greater physical and social vulnerability, be more fearful of crime. It was also hypothesized that members of the public who perceived crime as having increased in their community would have a higher level of fear than others. Finally it was hypothesized that those who had been recently victimized, or who had had a member of their household recently victimized, would be more fearful.

## Method

The data for this study were obtained from separate surveys of the four South African population groups. [3] The surveys were conducted by means of interviews for blacks, coloureds, and Indians while a postal survey was used for whites.[4] The survey among whites was carried out in all areas – that is cities, towns, and rural areas whereas the surveys among coloureds and Indians were conducted in cities and towns only. To obtain uniformity whites in rural areas were excluded from the data used for analysis.

The sample for the black survey was drawn from the Pretoria/ Witwatersrand/Vereeniging (PWV) area only. Data relevant to the subgroup 'blacks' in this study can therefore only be considered representative of blacks in the PWV area. [4]

The final samples (those used for analysis) consisted of 1 500 blacks, 904 whites, 1 265 coloureds, and 1 418 Indians. A comparison of the samples with 1985 census figures shows that the samples for whites, coloureds, and Indians were highly representative of the wider population with respect to age and sex. However, there was a slight overrepresentation of females and an underrepresentation of those in the age group 18–24 for whites and coloureds. The sample for blacks could not be compared with census data as it was drawn from the PWV area only and also because of a possible undercount in the census figures.

The surveys for coloureds and Indians were conducted in 1985 while those for blacks and whites were conducted in the early part of 1986.

### Measurement of variables

Perception of likelihood of victimization was used as the dependent variable measuring fear of crime. This conceptualization is one that has been used extensively by other researchers in this field (Giles-Sims, 1984). Respondents were asked to rate the likelihood of their becoming a victim of a crime such as assault, theft, robbery or rape within the next 12 months; possible responses were 'very probable', 'probable', 'improbable', 'very improbable', and 'do not know'.

The independent variables used in the study correspond with the hypotheses outlined earlier. Standard background variables used were sex, age, area of residence, and educational level. Educational level was used as an indicator of socioeconomic status. The perceived seriousness of crime in the community was measured in two ways. Firstly individuals were asked to rate the seriousness of crime as a social problem in their community and to rank its importance among a list of other social problems, and secondly they were questioned about their perception of crime rates, that is whether crime had increased, decreased or remained the same in their community over the past year. Although frequencies for both measures are presented, only the perception of crime rates was used in the analysis as an independent variable measuring perceived seriousness of crime in the community.

Experience of victimization was assessed by asking the respondent whether he/she or a close relative living with him/her had been a victim of either a property crime (theft of money, goods or motor vehicle) or a personal crime (robbery, assault or rape) within the past 18 months.

## Analysis of the data

The multivariate statistical technique 'Multiple Classification Analysis' (MCA) was used for the analysis of data. The MCA technique, like other multivariate techniques, allows for the control of the effects of correlations between predictors (standardization). Clemente and Kleiman note that "… without multivariate analysis it is impossible to assess the independent effects of relevant variables" (1977: 521).

The MCA technique is suited to analyses involving an intervally scaled dependent variable and nominally sealed independent variables. For this reason the dependent variable, perceived likelihood of victimization, was recoded into two categories, namely (1) victimization probable or highly probable and (2) all other responses. As Clemente and Kleiman note, since the newly created variable has only one interval, that between presence in and absence from the given category, the equal interval requirements of an interval scale are met.

The independent variables were also further categorized. Standard categorizations were used for the background variables sex, age, area, and educational level (sex – male, female; age – 18–24, 25–34, 35–44, 45–54, 55 or older; area – city, town; educational level – Std 5 or lower, Std 6 or 7, Std 8 or 9, Std 10, post-matric qualifications). Perception of the crime rate was dichotomized into (1) perception that crime rate had increased and (2) perception that crime rate had decreased or had remained the same. The variable 'experience of victimization' was also dichotomized into (1) those who had experienced victimization (either directly or through a household member) in the previous 18 months and (2) those who had not. It would have been useful to have maintained a distinction between victims of property crime and victims of personal crime but the rate of personal victimization was too low to yield statistically meaningful results.

A further restriction on the use of MCA is that the data must be understandable in terms of an additive model; this implies the absence of interaction effects[6] (Andrews, Morgan & Sonquist, 1969). Because of the socio-

economic differences between the South African population groups, in particular with regard to the nature of residential areas, the data relating to the different population groups were analysed separately in order to minimize interaction effects. No significant interaction between predictors within each subgroup was detected.[7] The use of MCA was therefore justified.

In addition to MCA a significance test was also carried out on the analysis of each variable included.[8] These significance tests were based on unstandardized data.

## Results

Before presenting the results of the MCA the frequency distributions of a few variables are presented which indicate important trends regarding victimization levels and perceptions of crime.

In table 1 the frequencies and percentages are shown for affirmative responses of respondents to the question concerning whether they, or a close relative living in the same house, had been a victim of either a personal or property crime during the period of 18 months prior to the survey. In the absence of appropriate official data these figures were used as a measure of the extent of victimization for the different subgroups. The sample of whites represents the most victimized subgroup with regard to property crime with the number of reported victimizations to sample size being 47%. This figure was 31% for the blacks, 27% for the coloureds, and 26% for the Indians. With regard to personal crimes the blacks reported the highest number of incidents according to sample size (32,5%). This contrasts with 18% for the coloureds, 10% for the Indians, and 4% for the whites. The overall extent of victimization, according to the data, was greatest among the blacks.

**Table 1** Frequency and percentage distribution of the extent of victimization as reported by South Africans: affirmative responses to the question 'Have you or a close relative living with you been the victim of the following crimes during the past 18 months?'

| | Blacks | | Whites | | Coloureds | | Indians | |
|---|---|---|---|---|---|---|---|---|
| **Type of crime** | **Frequency** | **%** | **Frequency** | **%** | **Frequency** | **%** | **Frequency** | **%** |
| **Property crime** | | | | | | | | |
| Theft of money or goods exceeding R20 | 330 | 22,0 | 346 | 38,3 | 246 | 19,4 | 261 | 18,4 |
| Theft of motor vehicle or motor cycle | 135 | 9,0 | 80 | 8,8 | 97 | 7,7 | 107 | 7,5 |
| **Personal crime** | | | | | | | | |
| Robbery with violence | 126 | 8,4 | 15 | 1,7 | 82 | 6,5 | 67 | 4,7 |
| Assault that caused pain and injury | 299 | 19,9 | 16 | 1,8 | 125 | 9,9 | 65 | 4,6 |
| Rape | 63 | 4,2 | 3 | 0,3 | 23 | 1,8 | 4 | 0,3 |
| | *N* = 1 500 | | *N* = 904 | | *N* = 1 265 | | *N* = 1 418 | |

The percentage distribution of fear of crime, concern about crime as a social problem, and perception of crime rates for the different subgroups is shown in table 2. Figures for fear of crime (as indicated by probability of victimization) and concern about crime were high for all the subgroups although certain differences between groups can be noted. Figures relating to fear of crime, as indicated by probability of victimization, were highest for coloureds and Indians (67%), slightly lower for whites (65%), and substantially lower for blacks (54%). In contrast concern about crime was very high among blacks, coloureds, and Indians (77%, 69%, and 65% respectively, regarded crime as a serious problem) whereas only 48% of whites considered the crime problem to be serious. While 77% of blacks saw crime as a serious problem it was regarded by only 7% of blacks as the most serious problem; similarly only 8% of coloureds and Indians regarded crime as the most serious problem. In the case of whites crime was ranked as the second most serious problem with 20% of whites regarding it as the most serious problem. A high percentage of respondents, in particular whites (57%) and blacks (61%), saw crime as having increased during the previous year. Only 3% of whites regarded crime as having decreased.

**Table 2** Frequency and percentage distribution of South Africans' perceptions of the probability of victimization, the seriousness of crime as a social problem, and neighbourhood crime rates

| | Blacks | | Whites | | Coloureds | | Indians | |
|---|---|---|---|---|---|---|---|---|
| **Perceptions** | **Frequency** | **%** | **Frequency** | **%** | **Frequency** | **%** | **Frequency** | **%** |
| 1. Probability of victimization | | | | | | | | |
| – High | 802 | 53,5 | 584 | 64,6 | 849 | 67,1 | 658 | 67,4 |
| – Low | 698 | 46,5 | 320 | 36,4 | 416 | 32,9 | 462 | 32,6 |
| 2. Crime as a social problem | | | | | | | | |
| (i) – Serious | 1 151 | 76,7 | 434 | 48,0 | 872 | 68,9 | 924 | 65,2 |
| – Not serious | 349 | 23,3 | 470 | 52,0 | 393 | 31,1 | 494 | 35,8 |
| (ii) Most serious problem | 105 | 7,0(5)* | 184 | 20,3(2)* | 102 | 8.1(5)* | 110 | 7,8(3)* |
| 3. Crime rate | | | | | | | | |
| – Increased | 911 | 60,7 | 517 | 57,2 | 492 | 38,9 | 479 | 33,8 |
| – Decreased | 436 | 29,1 | 30 | 3,3 | 281 | 22,2 | 279 | 19,7 |
| – Stayed the same | 153 | 10,2 | 356 | 39,4 | 492 | 38,9 | 660 | 46,6 |
| | *N* = 1 500 | | *N* = 904 | | *N* = 1 265 | | *N* = 1 418 | |

* This indicates the relative ranking of crime as a social problem among a list of other social problems which consisted of alcoholism, housing shortage, poor sport and recreational facilities, unemployment, pollution, drug abuse, poor educational facilities, and poverty.

A summary of the results of the MCAs performed on the data is given in tables 3 and 4. The significance levels of the independent variables for each subgroup are given in table 5.

READING

3

The MCA results show firstly the particular effect of each predictor on the dependent variable after holding the effects of all other predictors constant and, secondly, the combined effect of the different predictors in explaining the variation in the levels of the dependent variable. The particular effect of each independent variable is indicated by the adjusted means and beta values. The adjusted mean, represented in table 3, of any particular category of a predictor variable, represents the average level of fear of crime, after standardization, for that category. As is shown in the table, blacks who regarded the crime rate as not having increased were the least fearful (43,5%), while the most fearful category (80,5%) was coloureds who had had some recent experience of victimization. The relative importance of each independent variable (within a particular subgroup) is indicated in table 4 by the eta values (before standardization) and beta values (after standardization). The higher the beta value of a predictor the more important that predictor is in explaining fear of crime. The difference between the eta and beta values for each predictor indicates the effect of controlling for all other predictors. A drop in the eta value indicates a decrease in predictive ability after standardization and vice versa.

**Table 3** Multiple classification analysis (1): Adjusted means (percentages) of the dependent variable for each category of each independent variable

| Variable | Blacks | Whites | Coloureds | Indians |
|---|---|---|---|---|
| Overall mean – fear of crime | 53,5 | 64,6 | 67,1 | 67,4 |
| **Sex** | | | | |
| Male | 55,1 | 63,2 | 64,5 | 65,5 |
| Female | 52,3 | 65,8 | 69,1 | 69,1 |
| **Age** | | | | |
| 18–24 years | 52,7 | 57,7 | 67,3 | 60,9 |
| 25–34 years | 56,8 | 67,1 | 69,7 | 67,0 |
| 35–44 years | 52,8 | 65,2 | 66,2 | 71,2 |
| 45–54 years | 53,4 | 62,8 | 69,1 | 69,2 |
| 55 years and older | 49,3 | 65,1 | 61,9 | 72,3 |
| **Area of residence** | | | | |
| City | – | 64,6 | 68,9 | 69,3 |
| Town | – | 64,6 | 65,1 | 59,5 |
| **Educational level** | | | | |
| Std 5 or below | 49,9 | –* | 62,9 | 61,1 |
| Std 6 or 7 | 57,5 | 80,4 | 69,2 | 58,9 |
| Std 8 or 9 | *51,8* | 70,5 | 67,5 | 70,2 |
| Std 10 | 56,8 | 66,4 | 73,0 | 76,1 |
| Post-matric qualification | 55,5 | 56,6 | –** | –** |
| **Experience with victimization** | | | | |
| Recent experience of victimization | 65,4 | 75,4 | *80,5* | 76,8 |
| No recent experience of victimization | 45,5 | 56,4 | 61,5 | 64,3 |
| **Perception of crime rate** | | | | |
| Increased | *59,9* | 74,4 | 78,6 | 75,0 |
| Decreased/stayed the same | 43,5 | *51,5* | 59,8 | 63,5 |

* The number of cases in this category was too low to yield meaningful data and these cases were therefore subsumed in the next category, i.e. Std 6 or Std 7.

** *The number of cases in this category was too low for statistical analysis and the cases were therefore subsumed in the preceding category, i.e. Std 10.*

The results reflected in table 3 show that there is little difference between levels of fear with regard to the various categories of the variables sex and age. This also applies to area of residence although, for the Indians, there was a significant difference between city and town residents with regard to fear of crime ($p < 0{,}005$). Although age and area are indicated in table 5 as significant for the coloureds ($p < 0{,}05$), an examination of the eta and beta values for these variables shows that their effect on the dependent variable decreases after standardization (area: eta value 0,07; beta value 0,04; age: eta value 0,09; beta value 0,05). For the Indians the effect of age increases after standardization (eta value 0,04; beta value 0,08) suggesting that age may be a significant predictor of fear of crime for this subgroup with fear of crime increasing with age.

**Table 4** Multiple classification analysis (2): Eta and beta values for each independent variable

| Variable | Blacks | Whites | Coloureds | Indians |
|---|---|---|---|---|
| **Sex** | | | | |
| Eta value | 0,029 | 0,034 | 0,046 | 0,009 |
| Beta value | 0,027 | 0,027 | 0,048 | 0,038 |
| **Age** | | | | |
| Eta value | 0,074 | 0,054 | 0,090 | 0,043 |
| Beta value | 0,047 | 0,052 | 0,050 | 0,084 |
| **Area of residence** | | | | |
| Eta value | – | 0,008 | 0,068 | 0,068 |
| Beta value | – | 0,000 | 0,040 | 0,083 |
| **Educational level** | | | | |
| Eta value | 0,084 | 0,105 | 0,097 | 0,127 |
| Beta value | 0,064 | 0,157 | 0,073 | 0,150 |
| **Experience of victimization** | | | | |
| Eta value | 0,210 | 0,220 | 0,224 | 0,133 |
| Beta value | 0,196 | 0,197 | 0,185 | 0,114 |
| **Perception of crime rate** | | | | |
| Eta value | 0,172 | 0,257 | 0,227 | 0,150 |
| Beta value | 0,160 | 0,238 | 0,195 | 0,116 |
| $R^2$(adjusted) | 0,07 (7%) | 0,11 (11%) | 0,09 (9%) | 0,05 (5%) |

**Table 5** Significance level* of each independent variable for each subgroup

| Variable | Blacks | Whites | Coloureds | Indians |
|---|---|---|---|---|
| Sex | ** | ** | ** | ** |
| Age | ** | ** | < 0,05 | ** |
| Area of residence | – | ** | < 0,05 | < 0,005 |
| Educational level | < 0,05 | = 0,001 | < 0,01 | < 0,0001 |
| Experience of victimization | < 0,0001 | < 0,0001 | < 0,0001 | < 0,0001 |
| Perception of crime rate | < 0,0001 | < 0,0001 | < 0,0001 | < 0,0001 |

* Significance levels are derived from *F* tests of statistical significance.

** The level of significance for these variables is greater than 0,05.

Educational level emerged as a more important predictor of fear of crime than age and sex. For Indians educational level was the most important predictor, as indicated by its high beta value. The effect of this variable, however, was not consistent between the subgroups – for whites, the higher the educational level, the lower the fear of crime. For Indians and coloureds the trend was reversed, that is fear of crime increased as educational level increased. The effect of education on fear of crime for blacks decreased slightly after standardization (eta value 0,08; beta value 0,06); fear of crime for this group also showed a tendency to increase as educational level increased although this was not consistent.

The most important differences between levels of fear of crime emerged with regard to experience of victimization and perception of crime rates. Those who had been a victim of crime or had had close contact with a victim were substantially more fearful than those who had had no direct experience with crime, as shown by the adjusted means in table 3. With regard to perception of the crime rate, those who thought crime had increased within the last 12 months were significantly more fearful than those who thought crime had decreased or had remained the same (see adjusted means in table 3). These variables are strongly significant ($p <$ 0,0001) and are the most important predictors of fear of crime as shown by their relatively high beta values. The predictive ability of the variables decreases slightly after standardization but remains high.

The combined effect of the different predictors is indicated by the adjusted $R^2$ values (bottom of table 4). The $R^2$ values can be interpreted as the percentage variation explained by the predictors after standardization. The results indicate that the predictors were most successful in explaining fear of crime levels among the whites (11% of variation explained) and least successful for the Indians (5% of variation explained).

## Discussion

In this study a number of factors influencing fear of crime among the South African public were examined. This was done by testing hypotheses, derived from the cognitive model, relating to fear of crime. These hypotheses concerned the influence of (1) personal characteristics, (2) the perceived seriousness of crime, and (3) experience of victimization on fear of crime.

With regard to personal characteristics it was hypothesized that females, urban residents, the elderly, and the poor would be more fearful of crime. This hypothesis was only partly supported as in most cases insignificant differences were found to exist in respect of sex, age, and area of residence. However, socioeconomic status – as indicated by educational level – was found to influence fear of crime levels significantly.

The findings relating to the effects of personal characteristics contrast with previous research findings which have almost consistently shown fear of crime to be greater among urban residents, women, and the aged. The disparity is in part due to measurement differences as American studies have generally tended to use measures of fear of crime that focus on personal crime, which is more closely related to vulnerability, while the mea-

sure of fear of crime in the present study focused on both personal and property crime.

The effects of personal characteristics have also, in previous studies, been found to be dependent on the nature of the environment. In areas where crime is a salient feature of the environment personal characteristics such as age have little effect on fear of crime as "everyone is more afraid" (Maxfield, 1984: 246). This would seem to apply in South Africa as this study shows a consistently high level of fear among the different subgroups as well as a strong concern about crime as a social problem; most South Africans also perceive crime to be on the increase.

While educational level is an important predictor of fear of crime, the effect of this variable was not consistent between the subgroups. Previous research has indicated that the higher the income level, the lower the level of fear of crime as higher-income groups are more isolated from the risk of personal victimization and are better able to protect themselves against property victimization. In this study this pattern was found to exist for whites but not for the other subgroups where fear of crime increased with socioeconomic status.

The differential effect of socioeconomic status on fear of crime for the different subgroups can be explained in terms of differing neighbourhood patterns. Upper-income white areas in South Africa tend to be fairly isolated from high-crime areas. In contrast upper-income coloured and Indian areas have lower-income high-crime areas situated more closely to them. Black residential areas are also not clearly differentiated along income lines. For the latter groups the risk of victimization tends to increase with socioeconomic status because of the proximity of high-crime areas. Residents of high-income areas are attractive targets for property crimes and may also perceive the threat of personal victimization to be greater.

The cognitive model of fear of crime is supported with regard to the perceived seriousness of crime and experience of victimization. Those who see crime as having increased and those who had close experience of victimization are significantly more fearful than others.

In addition to the effects of the independent variables, important differences between the subgroups can be noted. The finding that most blacks see crime as a serious social problem but are the least fearful, contradicts earlier findings which indicated that fear of crime is greatest among blacks and the poor while concern about crime as a social issue is concentrated in the middle class (Conklin, 1975). However, in previous studies concern about crime was measured by the relative ranking of crime among a list of other social problems. The findings of this study indicate that crime might be regarded as a serious social problem, but would be ranked relatively low with regard to other problems – such as unemployment and housing which are perceived as more serious.

The relatively low level of fear among blacks (as compared with the other groups) would seem inconsistent with the high reported rate of victimization, especially personal victimization as well as the strong perception of increasing crime rates. In addition the sample was drawn from urban blacks whom one would expect to be more fearful than rural blacks. The explanation of the relatively low level of fear might lie, in fact, in the high

rate of crime. In this regard Conklin argues that residents of areas with a very high crime rate tend to deny their high risk of victimization in order to preserve a sense of security. Thus recognition of the strong likelihood of victimization in areas with a high crime rate would make continued residence in such areas difficult. Similarly Skogan notes that

> … some healthy anxiety is a good thing … it is when fear is incapacitating or not linked to environmental conditions that it can be dysfunctional (1987: 152).

The findings of this study indicate that there may be a threshold up to which fear of crime increases with increases in objective risk but beyond which individuals tend to deny their high risk of victimization.

The high level of fear of crime among whites can be interpreted as a direct result of increasing property crimes – 57% of whites saw crime as having increased while reported incidents of victimization indicate a low level of personal victimization for this group and a very high level of property victimization. Among Indians and coloureds both personal and property victimizations appear to have played a role in the high level of fear.

The low percentage variation explained by the predictor variables, especially for blacks and Indians, suggests that the variables used in this study were not important in explaining fear of crime. A percentage variation of more than 20% is, however, infrequent in the social sciences. The low percentage explained is also partly due to problems of measurement. Area distinctions for instance were based only on a city-town distinction while the findings indicate that neighbourhood differences may be more important. A distinction also needs to be made between fear of personal crime and fear of property crime as well as between personal victimization and property victimization. Unfortunately this is not always possible as personal victimization rates are usually low. As Skogan notes "generally, the more conventionally serious an incident is, the less frequently it occurs" (1987: 139).

## Conclusion

Although the study was confined to non-farming areas and blacks in the PWV area only, the findings suggest a high level of fear of crime among the South African public. While the cognitive model seems suited to explaining this fear, it is clear that experience of victimization and environmental factors is more important than personal characteristics in explaining differences in fear levels. A shortcoming of the study, however, is that no distinction was drawn between fear of personal crime and fear of property crime. It is possible that differences in fear of crime levels will emerge with regard to sex, age, and area of residence, when focusing on personal crime. Future research on fear of crime in South Africa should distinguish between these two types of fear.

Another subject for future research suggested by this study is the influence of neighbourhood factors on fear of crime. The importance of perceived seriousness of crime in the community as well as the interaction

between population group and socioeconomic status suggests that there should be a greater emphasis on neighbourhood conditions. Community studies of fear of crime would be particularly valuable in this respect.



## Notes

1. The perceptual approach in criminology (Henshel & Silverman, 1975) can be considered to be compatible with the rational model. In this approach the view is adopted that individuals act on the basis of what they think a situation is, regardless of what the situation actually is. However, little use has been made of the perceptual approach in the study of fear of crime.
2. Perception of the seriousness of crime may seem to the reader to be equivalent to fear of crime. The two are, however, conceptually distinct. Perception of the seriousness of crime refers to a perception of a general situation while fear of crime refers to an individual's specific fear of actual victimization. As such the two are not necessarily related, for instance an individual may perceive crime in his/her neighbourhood to be high but may take extensive measures to reduce the chances of actual victimization, thereby reducing individual risk.
3. The surveys were conducted by the Opinion Survey Centre of the HSRC. Because of practical and financial considerations a postal survey was used for whites and the black sample was restricted to the PWV area. A high return rate for the postal survey among whites suggests no serious systematic error in the relevant data and indicates comparability with the other samples.
4. The postal survey for the whites yielded a return rate of 78 %, which is considered to be satisfactory. The return rates from the interview surveys were 95 %, 84 %, and 100 % for the Indians, the coloureds, and the blacks respectively.
5. Although income level was also measured, this variable was not used in the analysis because of possible statistical interaction between this variable and that of educational level.
6. Interaction is said to exist when the effect of one predictor on the dependent variable is dependent on the level of another predictor. For instance Baumer (1985) found age to be a significant predictor of fear of crime among men but not among women.
7. Interactional analysis was carried out by means of the Chaid programme (Chi-squared automatic interaction detection).
8. While MCA does not provide for assessment of statistical significance, it is possible to perform statistical tests for each variable from the summary statistics (unadjusted) of the MCA output. The test used in this regard is the *F* test.

READING

3

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# READING 4

# *American TV and social stereotypes of Americans in Taiwan and Mexico*

ALEXIS S. TAN, SARRINA LI and CHARLES SIMPSON

*"Dallas" and "Dynasty", most watched American programs in these countries, may be cultivating negative image of the US.*

The United States continues to be the major exporter of television programs to the rest of the world. In 1983, imported programs constituted about one-third of total programming in more than 70 countries. The United States was the source of about three-quarters of imported programs in Latin America, 44% in Western Europe, and 33% in Asia and the Pacific.[1] Most programming from the United States is entertainment although some educational programs are also exported.

To many foreign audiences, American television is the only or main source of information about American culture and people. It is important therefore to understand how American television is perceived by its foreign audiences, and to determine the images of Americans that American programmes are projecting abroad. This study analyzes the relationship between exposure to American television programs and the social stereotypes of Americans held by adult audiences in two countries where American programs are readily available – Taiwan and Mexico.

Several theoretical formulations support the expectation that the images of the United States portrayed in American television will be internalized and accepted to be accurate representations of reality by foreign audiences. Bandura's social learning theory, for example, explains how we learn by observation, particularly when the observed event is reinforcing to the viewer. We learn not only behaviors, but also values, stereotypes and beliefs by observation.[2] Gerbner suggests that television is a major influence on audience perceptions of the facts, norms and values of society through selective presentations and by emphasizing certain themes. Gerbner and his colleagues have shown that heavy television viewing is correlated to many real world perceptions – such as fear of crime and estimates of real-life violence – and to common perceptions of economic class membership, political ideology and opinions on specific social and economic issues.[3] Adoni and Mane suggest that television's influence on our social realities depends

not only on our dependence on the medium for information, but also on our direct experiences with the response to be learnt or assimilated.[4] The influence will be greatest when dependence on the medium is high, and when direct experience with the response to be learned is limited.

Research on social stereotypes, the dependent variable in our study, is not new. Social psychologists have long been interested in the interpersonal and intrapersonal dynamics of social stereotypes and prejudice.[5] Conceptually, social stereotypes are generalized impressions of groups.[6] Operationally, a social stereotype is the collection of traits assigned to the members of a category. When there is consensus in the assignment of traits within a given population of judges, then the stereotype becomes a social norm for describing recognized groups. A single individual's assignment of traits to the group is his or her personal stereotype, regardless of whether there is consensus or not among other judges.[7]

Most early research on social stereotypes was descriptive. The objective was simply to describe stereotypes of various ethnic and religious groups. In 1933, Katz and Braly asked 100 Princeton undergraduates to list the five key traits that would best describe 10 different racial and national groups.[8] They found a high degree of agreement (in some cases, up to 75 percent) on the traits used to describe these groups. Many of the traits chosen, particularly for the Chinese, Japanese, Jews, Turks and 'Negroes' were highly derogatory. Americans in general were characterized quite positively – as being industrious, intelligent, materialistic, ambitious, progressive, pleasure-loving, alert and efficient.

Gilbert repeated the Katz and Braly survey in 1951 at Princeton.[9] He found that agreement on traits used to describe most of the groups decreased, particularly for those that had been negatively characterised in 1933. In 1967, the survey was again repeated at Princeton, this time by Karlins, Coffman and Walters.[10] The 1967 study showed even less agreement on social stereotypes among the students. Americans were less positively characterized than in earlier studies. The three most common traits assigned to American in 1967 were materialistic, ambitious and pleasure-loving. Karlins *et al.* concluded that traditional negative stereotypes of racial and national groups continue to 'fade' and that students at Princeton then were more careful in their thinking and consideration of ethnic generalizations.

Social stereotypes are learned from direct and oftentimes isolated experiences with members of the stereotyped group, and through socialization from family, peers and the community.[11] Another possible source of social stereotypes is television. Considering the pervasiveness of television and its demonstrated influence on audience perceptions of other social realities, it is not unreasonable to expect that the pictures in our heads of racial and national groups can be influenced significantly by the pictures we get of them in television.[12]

## Procedures and measures

Identical questionnaires were administered to purposive samples in Taiwan and Mexico.

One thousand questionnaires were distributed to fixed groups in northern (n = 400), central (n = 300) and southern (n = 300) Taiwan. Of these 1 000 questionnaires, 600 were distributed by teaching assistants in universities, where students filled them out in classrooms and dormitories. The remaining 400 questionnaires were distributed by Chinese research assistants to non-students, including teachers and other personnel in high schools and elementary schools, trainees for diplomats who had just passed a 'National Test for Diplomats', and persons working in post offices and a bank. The questionnaire was in Chinese and was self-administered. Of the 1 000 questionnaires distributed, 788 were completed and returned by our Chinese research assistants to the researchers in the U.S. by the cut-off date (May 5, 1985).

The Mexican sample consisted of 150 college students attending a university in Mexico City. While this purposive sample is not representative of all college students in Mexico, it consists of persons most likely to assume positions of leadership in their government.[13] The self-administered questionnaire was distributed by Mexican instructors at a general assembly of students in March , 1985. All questions and instructions were in Spanish.

Of particular relevance to this paper are the following variables measured in the questionnaire. (The Mexican and Chinese questionnaires were identical except for the language.)

## Television use and exposure to American television

Respondents were presented with a list of all American television programs which were then being aired in their countries, and were asked how often they watched each program on a five-point scale. The points on this scale were 'every week', 'almost every week', 'about once a month', 'about once in 2 months' and 'never or almost never'. For the Chinese sample, 57 American programs were listed (in their Chinese translations); 74 American programs were listed (in their Spanish translations) for the Mexican sample.

Respondents were also asked how many hours they watched television daily, which American television programs they thought most accurately portrayed American culture and people, and how accurately they thought American television programs (in general) portrayed 'what the United States is like' and 'how Americans act'. Responses to the questions on accuracy of portrayals were on a five-point scale, from 'very accurately' to 'not at all accurately'.

## Social stereotypes

We presented our Chinese and Mexican respondents with a list of 37 adjectives and their definitions (see table 2). We asked them to pick the 10 adjectives which were most descriptive of Americans in general, and then to rank the top ten from 1 (the most descriptive) to 10 (the least descriptive among the top ten). The list of adjectives and the procedure for scoring to approximate interval scaling are derived from previous studies of social stereotypes.[14]

## Demographics and other control variables

Respondents were asked to indicate their age, sex, education in the Taiwan sample), and occupation of head of the family (in the Mexican sample).They were also asked how often they interacted with Americans, how often they watched American movies, and how often they had been to the United States.

The questionnaire was originally written in English, and then translated into Chinese and Spanish by graduate students in the U.S. who were native speakers of the those languages. It was pre-tested for accuracy of translations and local applicability of the scales in Mexico city and Taipei. Minor revisions were made before the final versions were administered to our samples.

## Results and Discussion

The Chinese sample of 788 was 60% female and 40% male. The average age was 24.38 years; the average number of years in school completed was 14,96; 73,1% were students.

Of the Chinese respondents, 96,7% had at least one television set at home; 95% had never been to the United States. Interpersonal contact with Americans was infrequent: 22% did not have any contact at all with Americans, 38,9% had 'very little' contact, and 16,8% had 'some' contact. On the average, our Chinese respondents watched television 1,7 hours daily and saw 3,02 movies (in a movie theatre) per month.

For the Mexican sample, the average age was 22; 68,5% were females. More that 80% (81,1) understood English; 93,5% had been to the United States, and 79% said they had 'frequent' contact with Americans. Almost all of the respondents (more than 90%) listed a profession (e.g., engineer, businessman, doctor, lawyer) as the occupation of their head of household, indicating that respondents came from high income families.

All the Mexican respondents had television sets. They reported watching an average of 2,8 hours of television daily, and saw an average of 9 movies (in a movie theatre) per month.

As table 1 shows, the most often watched American television programs in Taiwan are *Three's company* which is watched by 76,9% of the sample 'every week', and *Hawaii Five-O,* watched by 50,7% 'every week'. The most popular American television programs in our Mexican sample were *Love Boat, Magnum P.I., Hotel* and *Dynasty.*

Our Chinese respondents considered *Dallas* (27,78%) and *Three's company* (23,22%) to be the programs which most accurately depicted American culture and people. The programs listed most often by our Mexican sample to be accurate depictions of the United States were *Dynasty* (24,74%) and *Dallas* (22,68%).

Most Chinese (66,6%) felt that American television programs were 'somewhat accurate' portrayals of Americans and American culture, while most Mexicans felt that American television programs portrayed the United States either 'quite accurately' (45,9%) or 'very accurately' (13,9%).

**Table 1** Most frequently seen American television programs, ranked by mean score[1]

| Taiwan | | Mexico | |
|---|---|---|---|
| **Program (Rank)[2]** | **Mean score** | **Program (Rank)[3]** | **Mean score** |
| Three's company (1) | 4,033 | Love boat (1) | 2,991 |
| Hawaii Five-O (2) | 3,349 | Magnum P.I. (2) | 2,983 |
| Love boat (3) | 3,341 | Hotel (3) | 2,856 |
| Mission impossible (4) | 3,103 | Dynasty (4) | 2,851 |
| The A-team (5) | 2,923 | Trapper John M.D.(5) | 2,812 |
| Charlie's angels (6) | 2,881 | Hart to Hart (6) | 2,756 |
| Different strokes (7) | 2,871 | Dallas (7) | 2,692 |
| Star trek (8) | 2,716 | Quincy (8) | 2,691 |
| Six million dollar man (9) | 2,690 | Ripley's believe it or not (9) | 2,681 |
| Starsky and Hutch (10) | 2,631 | That's incredible (10) | 2,658 |
| Lassie (11) | 2,531 | Fantasy island (11) | 2,633 |
| Dallas (12) | 2,450 | Walt Disney (12) | 2,517 |

1. Ranked by mean scores derived from 1 to 5 scale with 1 = never or almost never watched to 5 = watched each week.
2. American programs were rated by the Chinese example.
3. American programs were rated by the Mexican sample.

The adjectives used most often to describe Americans by our Chinese and Mexican samples are shown in table 2. The Chinese described Americans as, in order of frequent of mention, individualistic, conceited, practical, athletic, ambitious, scientifically minded, straight-forward, pleasure-loving, mercenary, courteous, materialistic, artistic, argumentative, sensual, aggressive and passionate. The adjectives used most often by Mexicans to describe Americans were, in order of frequency of mention, materialistic, ambitious, artistic, practical, industrious, efficient, individualistic, pleasure-loving, intelligent, athletic, aggressive and arrogant. Several adjectives appear in both the Mexican and Chinese lists of most descriptive adjectives. These are individualistic, practical, athletic, ambitious, pleasure-loving, materialistic, artistic and aggressive.

To find out whether the viewing of American television programs is related to a particular social stereotype of Americans, we identified the programs considered by our samples to be the most accurate portrayals of Americans. We then ran partial correlations between frequency of viewing these programs and the ratings of individual adjectives used to describe Americans in the 'real world', controlling for demographic variables and frequency of contact with Americans. We looked at particular programs as predictors, rather than total exposure to American television, since conflicting images may be projected by different American programs. It is much easier to identify the particular images projected by individual programs rather than by *all* American programs. The predictive programs we used in our analysis were those that our respondents considered to most accurately portray Americans. These were *Dallas* and *Three's company* in Taiwan, and *Dallas* and *Dynasty* in Mexico. These programs were also among the most frequently watched by our Chinese and Mexican samples.

**Table 2** Adjectives attributed to Americans, ranked by means[1]

| Taiwan | | Mexico | |
|---|---|---|---|
| **Adjective (Rank)[2]** | **Mean score** | **Adjective (Rank)** | **Mean score** |
| Individualistic (1) | 3,797 | Materialistic (1) | 4,621 |
| Conceited (2) | 3,748 | Ambitious (2) | 4,266 |
| Practical (3) | 3,701 | Artistic (3) | 4,089 |
| Athletic (4) | 3,563 | Practical (4) | 3,815 |
| Ambitious (5) | 2,991 | Industrious (5) | 3,460 |
| Scientifically-minded (6) | 2,562 | Efficient (6) | 3,210 |
| Straight-forward (7) | 2,283 | Individualistic (7) | 2,653 |
| Pleasure-loving (8) | 2,053 | Pleasure-loving (8) | 2,339 |
| Mercenary (9) | 1,972 | Intelligent (9) | 1,895 |
| Courteous (10) | 1,954 | Athletic (10) | 1,750 |
| Materialistic (11) | 1,776 | Aggressive (11) | 1,532 |
| Artistic (12) | 1,715 | Arrogant (12) | 1,218 |
| Argumentative (13) | 1,668 | | |
| Sensual (14) | 1,626 | | |
| Aggressive (15) | 1,499 | | |

1. Means were derived from an 11-point scale, from 0 (the adjective is not descriptive of Americans at all), to 10 (the adjective is most descriptive of Americans).
2. 37 adjectives were presented to our Chinese and Mexican samples.

While we did not formally analyse the contents of these three programs, media critics have agreed that *Dallas* and *Dynasty* depict materialism, wealth, aggression, dishonesty and the pursuit of pleasure, while *Three's company* depicts the pursuit of pleasure and sex.[15]

In our Chinese sample, the frequency of viewing *Dallas* was positively related to characterizations of Americans as materialistic ($r = ,158$, $p < ,01$), and negatively related to characterisations of Americans as honest ($r = –,179$, $p < ,01$). These partial correlations controlled for frequency of contact with Americans, frequency of movie-going, age, and education of respondents. Also in the Chinese sample, frequency of viewing *Three's company* was negatively related to characterizations of Americans as faithful ($r = –,171$, $p < ,01$), and positively related to perceptions that the divorce rate is high in the U.S. ($r = ,083$, $p < ,05$), and that there is a lot of 'personal freedom' among Americans ($r = ,072$, $p < ,05$).

In the Mexican sample, frequency of watching *Dynasty* was positively related to perceptions of Americans as individualistic ($r = ,159$, $p < ,05$) and pleasure-loving ($r = < ,169$, $p < ,05$), and negatively related to perceptions of Americans as honest ($r = –,189$, $p < ,01$). Frequency of viewing *Dallas* was positively related to perceptions of Americans as aggressive ($r = ,178$, $p < ,05$) and cruel ($r = ,1612$, $p < ,05$), and negatively related to perceptions of Americans as honest ($r = –,2349$, $p < ,01$) industrious ($r = –,1796$, $p < ,05$) and scientifically-minded ($r = –,2331$, $p < ,01$). Control variables for these partial correlations were frequency of contact with Americans and frequency of movie-going. Age and income were not controlled for, since the sample was homogeneous on these two characteristics.

While these correlations are modest, a pattern of relationships is apparent in both samples. The images of Americans depicted in the three programs considered by our respondents to be the most accurate portrayals of Americans are projected to some extent to Americans in general by heavy viewers of these programs, And, for the most part, these images are negative, consisting of characterizations of Americans as dishonest, materialistic, pleasure loving, aggressive and cruel. In particular, these results suggest that *Dallas* and *Dynasty,* two programs which are becoming increasingly popular in the foreign television market, may be cultivating a negative image of Americans among foreign viewers.

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8. Daniel Katz & K.W. Braly. 1935. Racial prejudice and racial stereotypes. *Journal of Abnormal and Social Psychology,* 30: 175–193.
9. George Gilbert. 1951. Stereotype persistence and change among college students. *Journal of Abnormal and Social Psychology,* 46: 245–254.
10. Karlins, Coffman & Walters, *op. cit.*
11. Allport, *op. cit.*
12. Although a 'cultural imperialism' argument might suggest that increased exposure to a foreign culture would lead to more favourable affect towards that culture, we have chosen to take a more microscopic view of the effects of exposure to American television on social stereotypes among a foreign audience. Some current theorizing on mass media effects indicates that effects are most likely to be identified when the nature of the stimulus (the message) is specified, and when interpretation of the stimulus by the receiver and subsequent activation of thoughts and memories are taken into account. (See, for example, Leonard Berkowitz and Karen Rogers. 1986. A priming effect analysis of media influences. In: Jennings Bryant and Dolf Zillmann (eds). *Perspectives on media effects.* Hillsdale, H.J.: Larence Erlbaum p. 57–81; also, Alexisis Tan. 1986. Social learning of aggression from television. In: Bryant and Zillmann, *op. cit.* p. 41–55). Given this view, the influence of imported television programs can either be positive or negative, depending on which programs are watched and the symbols present in these programs. It would not be in keeping with our cognitive models of media effects to look at the relationship between total viewing of *all* American programs, since conflicting images and symbols may be communicated by different programs (e.g., *Different strokes* and *Three's company* certainly do not project similar images of American society).
13. The Mexican sample was taken from a university in Mexico city which was attended predominantly by students from high income families.
14. Karlins, Coffman & Walters, *op. cit.;* also Alexis Tan. 1982. Television use and social stereotypes. *Journalism Quarterly,* 59: 119–122.
15. E.g. *Newsweek,* Aug. 16, 1982, p. 44; *Newsweek,* June 13, 1983, p. 66; *Newsweek,* Dec. 6, 1982, p. 136–140.

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# Index

**D**

## E

**N**



**O**



**P**

## S

**T**



**U**

## V



## W



## Z