

questions. *Change* is the only objective that requires 'how'-type questions. All the other objectives have questions beginning with 'what', or their questions can be transposed into this form. They are, therefore, either descriptive in nature, or involve comparisons between situations in the present, between a present and a past situation, or between a present situation and a desired future. To avoid the confusion that can result from other question wording, for example the pursuit of the objectives of *description* or *explanation* with questions that commence with 'how', this three-category classification of questions should be followed.

Conclusion

By way of summary, let me review the key points that emerge from this discussion of the role of research questions in social research.

- All research projects are built on the foundation of research questions.
- Research questions define the nature and scope of a research project.
- Research questions can be grouped into three main types, 'what', 'why' and 'how' questions.
- The three types of questions form a sequence for the research process; 'what' questions followed by 'why' questions followed by 'how' questions.
- Many research objectives require 'what' questions. It is only the aims of *understanding* and *explanation*, and possibly *evaluation* and *impact assessment*, that require 'why' questions, and the aim of *change* that requires 'how' questions.
- The importance of answering 'what' questions should not be underestimated.
- The developmental nature of a research design should not be used as an excuse to avoid the effort required to formulate appropriate research questions.
- While the process of developing a set of research questions can be the most challenging part of any research project, techniques are available to assist the process.
- Research questions are what the research is designed to answer, not the questions asked of respondents or participants.
- The aim of the literature review is to indicate what the state of knowledge is with respect to each research question, or group of questions.
- Hypotheses are our best guesses at answering 'why' and, possibly, 'how' questions.
- If required, hypotheses should be derived from the literature review, particularly from theory or research results. On rare occasions, a theory may have to be generated.
- In some research, hypotheses may emerge, and be tested, in the course of the data collection and analysis.

As an aid to the conception, clarification and classification of research questions, it is useful to think about a research project in terms of its objectives. These objectives are not a list of the activities the researcher is going to carry out. Rather, they can be either the analytical or the practical aims of a project.

4

Strategies for Answering Research Questions

Every inquiry must start somewhere. (Kaplan 1964)

Introduction

Having established a set of research questions, the next task is to devise ways to answer them. The approach taken to answering research questions depends on the type of question. Answering a 'what' question is usually easier than answering a 'why' or 'how' question. 'What' questions can be dealt with by making appropriate observations or measurements, i.e. collecting appropriate data, and then producing descriptions based on them. However, this process is not as simple as it sounds; descriptions of what we believe we have observed may not be, perhaps cannot be, pure descriptions. The observer, as an active participant in the process, has to make many decisions before a description can be produced, and cannot avoid imposing concepts and categories.

Answers to 'how' questions require a different kind of description; a possible state of affairs has to be described and ideas about how to get there have to be provided. As we saw in chapter 3, 'how' questions usually require answers to related 'what' and 'why' questions, either in the research being undertaken, or in previous research. Unless a good understanding of the nature of the phenomenon being investigated has already been achieved, and why it behaves the way it does, it is difficult, undesirable and even dangerous to begin to propose any form of intervention. However, the monitoring of limited interventions in 'safe' situations (i.e. ones that will not have ethically undesirable or socially unacceptable consequences) is one way of discovering answers to 'why' and 'how' questions. Action research is such a learning process. I will come back to the ways of answering 'what' and 'how' questions later in the chapter. In the meantime, I want to concentrate on how to answer 'why' questions.

The main problem in answering 'why' questions is where to look for the answers. How we deal with this will determine where the research process begins and how it

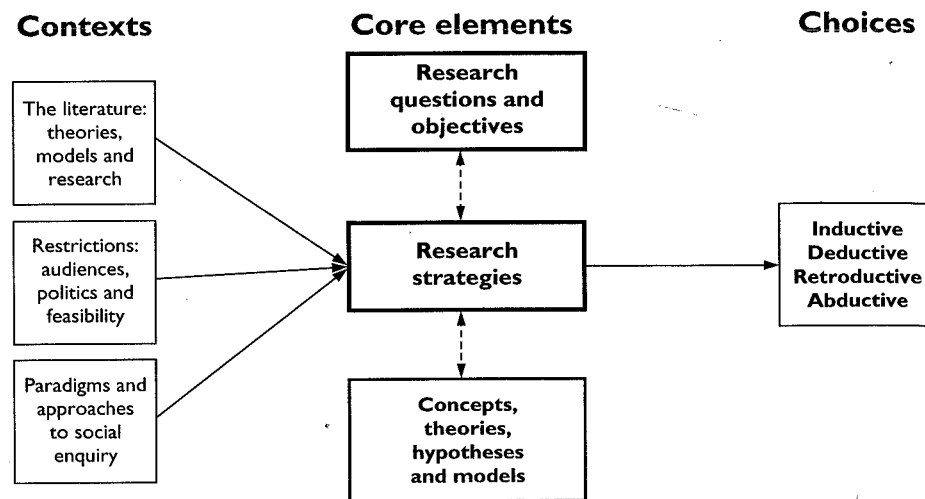


Figure 4.1 Research strategies

will proceed. Answering them involves dealing with theory in one form or another; *explanation* and *understanding* require either a theory or a very complex description. Hence 'why' questions present us with complex issues and choices.

There is a daunting array of possibilities. Are the answers to be found by collecting data and generalizing from them, by finding a suitable theory that will provide some hypotheses to test, by searching for underlying causal mechanisms, or by seeking social actors' meanings and interpretations? The choice made from alternatives such as these will depend on the research strategy that is adopted. A *research strategy*, sometimes called a logic of enquiry, provides a starting-point and set of steps by means of which 'what' or 'why' questions can be answered. Research strategies differ in their:

- ontological assumptions;
- starting-points;
- steps or logic;
- use of concepts and theory;
- styles of explanation and understanding; and
- the status of their products.

I shall discuss four research strategies; the *inductive*, *deductive*, *retroductive* and *abductive* (see figure 4.1). Each strategy has connections with particular philosophical and theoretical traditions, i.e. approaches to social enquiry (see Blaikie 1993a). As a preamble to their elaboration, the following parable is presented as a way of exploring the characteristics of the research strategies.

A Parable of Four Paradigms: Part I

Imagine you are a member of a group of social scientists that has just arrived on a strange planet inhabited by human-like creatures. It appears that these creatures have a sophisticated form of social life, although it bears little resemblance to that anywhere on Earth. The task of your group is to begin to describe and understand this totally different form of social life and to discover what kinds of social problems they experience. A major difficulty that confronts you is to know where to begin and how to proceed.

Perhaps, one day, social scientists may be faced with the same problem of understanding the social life of creatures from outer space. However, variations of this dilemma are encountered in much social research. This example just happens to be at the extreme end of a continuum, the other end of which is the everyday social world or worlds that the researcher inhabits. Between the very unfamiliar and the very familiar lies a range of forms of social life, each with its own challenges for the social researcher.

One of the dangers of conducting research in one's own society is to assume that, because it is familiar, research can proceed in a straightforward manner. However, societies of any size and complexity are heterogeneous in terms of worldviews, culture and lifestyles, and, in many cases, in language as well. In today's world, the fact of large-scale inter-country migration exacerbates this complexity. Normally, members of such societies, as well as social scientists, will experience only a limited range of this diversity. This means that social scientists are always likely to encounter unfamiliar social territory.

A consequence of this diversity and limited individual experience is that social research is much more complex than is frequently implied by textbooks on social research methods. The researcher has to develop an adequate acquaintance with the variety of sub-worlds that are present. The dominant ways of doing social research do not usually give this sufficient recognition.

To address the problem of where to begin and how to proceed, I want to explore the four major research strategies that are available in the social sciences, and to relate them to social research practice. These four strategies constitute four different ways of generating new social scientific knowledge. They provide fundamentally different procedures, with different starting-points and steps or stages that follow.

I believe that the choice of a research strategy is fundamental to any research design. This is because the research strategy has a large bearing on all the other decisions that have to be made in planning and designing a research project. To introduce the basic principles of the four research strategies, I have constructed a parable that reverses the situation in the opening paragraph of this section of the chapter. It reports a visit to Earth of some social scientists from outer space. The first part of the parable follows here; the second part will be found in chapter 7. If, after reading the first part of the parable, you feel you would like to read the two parts together, I invite you to do so. It was originally written that way. However, as some of the ideas may be unfamiliar, you may prefer to read each section in the context to which it relates. Of course, you may prefer to do it both ways!

Social Scientists from Outer Space

Once upon a time in the recent future, a craft arrived from outer space with a party of alien social scientists on board. Visits to Earth by inhabitants from the planet of Jarak Jauh (JJ) had occurred previously, but this was the first time that one had been made up of social scientists. Of course, the first visits to Earth had been greeted with both great alarm and curiosity. Obviously, it took some time before even elementary communication could be established, and then only with a few localized groups of Earthlings. Later visits were tolerated as the intentions of the Jarak Jauhans (JJans) turned out to be peaceful. Because visits to JJ were being planned, every effort was made to maintain good relations.

On this visit, the JJans landed in the spacious grounds of a university campus, and, after some difficult negotiations with the university authorities, due to communication problems, permission was given to roam freely about most of the campus. Because they were such a curiosity, the students tried to communicate with them in order to learn about life on JJ.¹

As a result of their previous visits, the JJans had gained some ideas about the physical features and flora and fauna on Earth, and they were aware of the physical form and some individual behaviour of Earthlings. However, they had not achieved any understanding of their social and cultural forms and patterns, nor of how and why particular human behaviour and social relationships occur.

The aim of this expedition was to compare Earthly social life with that on JJ and to see if this would help the JJans to find new ways of dealing with their social problems. They had set themselves some very general questions.

What are the dominant patterns of social relationships on Earth?

Why do such patterns exist?

To what extent have these patterns changed over time?

What have been the consequences of these changes?

However, they realized that while these questions satisfied the authorities on JJ that were funding the expedition, they would need to focus their research on some more specific questions.

Some navigation problems on the final descent forced the JJans to land on an open area that turned out to be the sports fields of the campus. It was not immediately clear to them just where they had landed and what Earthly activities were taking place there.

¹ One area of curiosity was, of course, how JJans reproduce. The students decided to set up a demonstration and invited the JJans to participate. The JJans selected two members of the expedition, and the students found a willing married couple from among their colleagues. The JJan pair stood facing each other and rubbed their antennae together. After some time, a drawer opened in the front of one of them and a baby JJan was lifted out. The Earthling pair then provided their demonstration. After it was over, the JJans asked where the baby was; they were told it was necessary to wait nine months. They then asked what all the hurry was at the end. (Adapted with appreciation from the joke competition conducted by the BBC World Service and a listener from the south of France.)

This was only partially revealed in the course of their research. However, they decided to confine their investigations to the campus precincts as this allowed them to live on their spacecraft and to move about without needing to use their personal rocket transporters.²

For many years on JJ there had been raging debates about the best way to advance knowledge of their culture, social life, social institutions and social structures. The protagonists gradually formed themselves into four paradigmatic research communities known as the Inductivists, the Deductivists, the Retroductivists and the Abductivists. When the expedition to Earth was planned, the authorities agreed to include teams from each of these social scientific communities. The idea was to use the research on Earth to establish the relative merits of these paradigms, and their accompanying research strategies, for advancing knowledge of social life on JJ. Therefore, the visitors decided to do their research on the campus in the four teams, each one using what it regarded as the best strategy of social research.

Exploration

Before they started the serious stage of their research, the JJans sent out an exploratory party to select the aspects of human social life on which they would focus. They accepted the idea that any comparison of the four research strategies must be made on the same research problem. The exploratory party consisted of the leader and an elected representative from each of the four teams. They met and agreed to focus attention on the human activities in the confined spaces that the Earthlings inhabited on the campus, as well as on the types of Earthlings to be found in them. The members of the party made a number of excursions around the campus individually, recording what they observed on their wrist-communicating computers. After an agreed period, they met to consolidate their observations and to prepare a report for their colleagues.

The JJans had discovered that the inhabitants of this part of Earth ranged in age. However, most of the Earthlings appeared to be young, although a few were older. Some of the older Earthlings behaved differently from the younger ones. This was most evident in the spaces in which they met during the 'lights', and sometimes in the 'darks'.³ The Earthlings usually met together for a 'chime', and sometimes for longer periods.⁴

These spaces varied in size, and, therefore, in the numbers of Earthlings that gathered in them. Some spaces were very large with up to 500 Earthlings present at

² JJan physiology had become adapted to this technology such that unaided movement over distances of more than a kilometre was no longer physically possible.

³ On JJ, the alternating intervals between day and night are called 'lights' and 'darks', and a combination of one cycle is called a 'lark'. They had noted that the length of a 'lark' on Earth was very much shorter than on JJ.

⁴ The exploratory party had observed some regularities in the duration that the groups of Earthlings met together and they decided to define a unit of time as being equivalent to the shortest normal duration. They had also noticed that the start of each interval usually corresponded with a chiming sound from a tall part of one structure. The number of chimes changed at the beginning of each period, starting with one and then increasing by one each time, until they reached twelve. Then the cycle repeated itself. They therefore decided to call each interval a 'chime', with the number of chimes identifying a particular period during the 'light' or 'dark'.

a time. At the other extreme, there were small spaces in which only two or three Earthlings would meet. However, for most of the time in these latter spaces there would be only one of the older Earthlings present. In between these two extremes, the exploratory party had found a variety of other spaces of different sizes and with different numbers of Earthlings present.

In most of the large spaces, the younger Earthlings sat in rows behind flat-topped objects on which they put things they had brought with them, and which they used during the time they were there. The rows rose in steps so that each row was a little higher than the one in front. An older Earthling usually stood at the front of these rows, facing the younger Earthlings, and behind an object on which it placed the things it had brought. The older Earthlings seemed to be trying to communicate something to the younger Earthlings that sat fairly quietly listening and, at the same time, making marks on the thin white sheets that they had brought with them.

The exploratory party also found three other kinds of specialized spaces. The first kind had flat floors on which flat-topped objects were arranged in rows and/or around the outside edges. The younger Earthlings stood or sat behind them. These flat-topped objects were larger and higher than those in the other spaces. On top were arranged objects of many shapes and sizes. The number of young Earthlings in these spaces was usually limited and their activities were different. While they sometimes faced the older Earthling that stood on one side of the space, for the most part they did things with the objects on the flat tops, either singly or in twos or threes. The older Earthling sometimes faced the younger Earthlings, sometimes walked around the space, and was sometimes absent. The periods the Earthlings spent in these specialized spaces were found to be longer than those spent in the other spaces. The Jjans also noticed that these spaces were concentrated in particular areas.

The second kind of specialized space was moderate in size. While it shared some things in common with some other spaces of this size, there were some special features. The floors were also flat, but the flat-topped objects behind which the younger Earthlings sat had on them what looked like very primitive and clumsy computers, with very primitive means of operating them. It was very rare to find the older Earthlings in these spaces, although one would sometimes wander around and seemed to offer help to the younger Earthlings. On rare occasions, they noticed that the behaviour in these spaces resembled that in some of the other similar-sized spaces, with the older Earthlings standing in front of the younger ones, apparently trying to communicate with them.

The third kind of specialized space was very different. Several of them were grouped together as well as being stacked on top of each other. They had many small flat-topped objects in them at which the younger Earthlings sat individually. Usually each object had a barrier around three sides that prevented neighbouring Earthlings from seeing what that particular Earthling was doing. These spaces also contained rows of tall narrow objects with limited space between them. These tall objects had a number of horizontal flat surfaces on each side, on which there were many bound sets of white sheets, almost all different. The younger Earthlings took these bound sheets, placed them on the objects where they sat, opened them, and spent a long time looking through them. At the same time, they also recorded strange symbols on their white sheets. There were usually no older Earthlings in these spaces, although the Jjans noted that there were a few near the one opening through which the younger Earthlings went in and out.

The exploratory party spent many 'larks' gathering information. In addition to digital photographic evidence, they brought back some artefacts with them, for example some of the things that the younger Earthlings had taken with them to these spaces and had left behind, and a few of the bound sheets.

The Jjans who had remained on the craft during this exploratory period of research were very impressed with what their colleagues had discovered. They asked many questions about what the Earthlings were doing. Apart from being able to describe what they had seen, the exploratory party was unable to answer most of the questions, although they offered comments based on their knowledge of JJan social life.⁵

After presenting the findings of this exploratory research to their colleagues, the JJan social scientists discussed what they thought should be investigated in the next stage of their work. They eventually decided to concentrate on the activities that occurred in the various spaces on campus. They settled on the topic:

'Social Interaction in Enclosed Spaces on Earth'

Because these activities continued for many hours nearly every 'light', and sometimes during the 'dark', and involved many Earthlings, although mostly younger ones, they concluded that they must be very important. Hopefully, they could learn something about a very common activity on the part of Earth on which they had inadvertently landed.

The Application of Four Research Strategies

The Inductive team

The Inductive team was feeling very confident because the exploratory work had already provided them with a great deal of information and some ideas about the range of things that they needed to observe. They decided to make many observations, to collect copious amounts of data, and then to produce some generalizations that they hoped would describe the patterns of life on this part of Earth. They believed that if their observations were systematic, and if they used objective procedures, they would be able to regard their generalizations as true descriptions of the laws of Earthly social life.

They formulated two general research questions to guide their activities:

What do Earthlings do in these confined spaces?

Why do they do it?

As they began their investigations, they tried to avoid making any assumptions about what was going on, and they certainly rejected the idea of working with any theories or hypotheses. They believed that in order to produce valid descriptions of what these Earthlings are doing, they must not interpret what they see. Rather, they must record

⁵ We need to note here that what the exploratory party saw was expressed in their own language, using familiar JJan concepts. Their descriptions also contained many assumptions that were drawn from their everyday experiences and professional practices on JJ. Had they been able to translate their preliminary report into the language of the Earthlings, it is likely that the Earthlings would have found parts of it strange and unrecognizable.

what is happening with a completely open mind. To do otherwise would lead to a distorted account of this social life.

The Inductive team was a little suspicious of some of the observations made by the exploratory group because some members of it were not committed to this method of objective observation. Hence, they decided to re-observe the various situations that had been identified, to collect more detailed data in the process, and, of course, to observe any other similar situations they might come across. They were keen to record what they observed by using their own senses and also by using their recording equipment. In this way, they believed that they would capture the facts as objectively as possible.

They almost decided to dismiss the idea of talking to the Earthlings, as they believed that in their approach to social research they should not rely on what participants can tell them. Instead, they should look for external evidence of the social facts that constitute the observed regularities in behaviour. In any case, they were aware of the enormous communication difficulties they would face in attempting to question the Earthlings. However, they did decide to try to elicit some very basic information by using a simple structured questionnaire in which each question had a predetermined set of response categories. They based the questionnaire on a simple version of the standard one used in social research on JJ, as this would allow them to do comparative analysis. Of course, constructing the questionnaire required them to translate JJan concepts into the language spoken on this part of Earth. While they were able to make use of the limited knowledge of the language obtained by earlier expeditions, they had to do some basic work themselves.

Questionnaires were given to a random sample of Earthlings using four strata based on the main types of larger spaces as the initial sampling units; systematic sampling was then used within each stratum. They thought that the structured questionnaire might make it easier for the Earthlings to understand what the researchers wanted to know, and it would ensure that the same information was obtained from each one. The questions included: how often they visited each kind of space; what kinds of activities they engaged in; how long they had been doing these activities; how long they expected to continue to do them; and whether these activities had changed over time. Of course, they also wanted to know how old the Earthlings were, which one of the four sexes they belonged to,⁶ how they had been educated,⁷ how many journeys they had made into space,⁸ and which research strategy they believed in.⁹ These were the standard questions asked in all social research on JJ.

⁶ On JJ, sex is a matter of choice rather than being biologically determined. There are four possible choices, to be a male, to be a female, to be neither (and thus not be involved in procreation) and to be both (and have a choice as to what part to play in procreation, perhaps different on different occasions). The choice that was made had social consequences, as there were prescribed roles for each sex. They assumed that Earthlings would have the same four choices.

⁷ JJans can choose to rote learn from their book of knowledge, to learn from experience with the assistance of an old and wise JJan, or to learn by engaging in research. They assumed that Earthlings have the same options.

⁸ Status on JJ is determined in this way, although extra status is achieved every time a JJan is a pilot or navigator on any of these journeys. They assumed that status on Earth is achieved in the same way, although they were not sure how often Earthlings had travelled into space.

⁹ The adoption of a research strategy is a matter of faith on JJ. It entails beliefs about the nature of reality, the components that make it up, how these components behave, and what causes behaviour.

They considered asking the Earthlings to record the answers to the questions on the wrist-communicating computers that all JJans carried with them, but they thought this advanced technology might produce response resistance. The wrist computers could have both dictated the questions by synthesized voice and recorded the verbal responses onto the database. They therefore resorted to the long since abandoned manual recording method, realizing that this was going to create extra work in entering the data into the main computer on the spacecraft.

In addition to using the questionnaire, the Inductive team also made observations of the Earthlings' behaviour and the spaces in which this behaviour occurred. They used their wrist computers to provide a checklist of all the items to be observed and to record this information in a prepared format. Verbal comments were also entered. This structured method of recording their observations ensured that all observers paid attention to the same things and recorded their observations consistently. The checklist included a wide variety of items, as they did not want to prejudice what the important regularities might be.

The fact that the Inductive team had made a prior decision about what should be recorded caused some consternation in the group as some members saw it as preventing them from observing with a completely open mind. However, the pragmatists won the day by arguing that, as their time was limited, they could not observe 'all the facts', only the relevant ones. They consoled themselves with the defence that their wide selection was not based on hypotheses or prejudices, but consisted of a list of what the exploratory study had shown to be relevant. These were the most obvious things to observe, and, after all, they were also readily accessible.

As well as recording the kind of behaviour that occurred in these spaces, the Inductive team documented the starting and finishing time of each occasion on which a group of Earthlings gathered in a particular space. They also tracked the movements of as many individuals as possible and tried to see how often the same individuals met together. While this turned out to be a very complex task, they were determined to complete it as well as possible within the time limits because they did not want to miss data that might be important.

The team worked very systematically and efficiently accumulating data. Each evening they took turns to enter the questionnaire responses into the spaceship's computer. After a month of intensive work, they had accumulated a prodigious amount of data and felt confident that they would be able to produce objective generalizations about the regularities in the behaviour of the Earthlings in the spaces selected.

The Inductive team confirmed several of the exploratory party's findings, for example, the age distribution of Earthlings in the various spaces, and the kinds of activities that take place in them. In addition, they discovered that:

- not all the Earthlings visited all types of spaces;
- the Earthlings had regular patterns in their visits to these spaces;
- the modal period of the visits to the large spaces, and some of the smaller spaces, was one 'chime';
- the modal period of the visits to some other spaces was three 'chimes';
- the period of the visits to the spaces with the computers varied widely;
- there was a reasonably strong correlation between the size of a space and the number of Earthlings that met in it;

- in the spaces in which older and younger Earthlings met, the older Earthlings dominated the activities.

The Inductive team was confident that they had established the important regularities in the Earthling's behaviour and they believed that knowing these patterns allowed them to explain further observations that they, or future expeditions, might make. However, as they were not content to let their generalizations rest on this limited research, they decided to use whatever additional time they had to accumulate more data to strengthen their conviction that these generalizations were true.

The Deductive team

The Deductive team examined the results of the exploratory study carefully to see if there was sufficient evidence for the existence of regularities that needed to be explained. Before commencing their task of explanation, they decided that they needed to be more confident of the patterns of interaction that occur in these spaces. With the help of some of the Retroductive team, they set about designing a detailed descriptive study, using the results of the exploratory study as a guide. How they went about this was not very different from what the Inductive team had done; they used the same methods, but their research was more limited in scope. The focus of their attention was on the dominant forms of behaviour of the younger and older Earthlings, and on the patterns of relationships between these two kinds of Earthlings in the confined spaces. In short, they were looking for the external manifestations of the regularities in Earthling behaviour.

After satisfying themselves that they had a good grasp of these patterns, they proceeded to construct a number of theories that they hoped would explain them. One pattern that stood out in the spaces where an older Earthling stood in front of the younger ones was that the older one dominated the activities. The younger ones generally remained passive and made complex marks on many white sheets. In the bigger spaces where this behaviour occurred, a few young Earthlings appeared not to be paying attention to the older Earthling; they appeared to communicate quietly with each other, they seemed to be sleeping or they sometimes threw small objects at each other. This latter behaviour seemed to be confined to certain groups of young Earthlings, but they were not sure what distinguished them except that most of them had short hair on their heads.

The Deductive team set themselves the following research questions.

Why are there many more younger than older Earthlings meeting together in these enclosed spaces?

Why do the older Earthlings stand up and the younger ones sit down?

Why do the older Earthlings dominate the activity and the younger ones generally remain passive?

Why do the older Earthlings read from their white sheets and the younger ones make marks on theirs?

One member of the Deductive team was given the task of searching the databases they had brought with them for reports of all research conducted on JJ on interaction in confined spaces. This JJan was able to find a number of reports as well as some theories that had been well tested on JJ. However, these theories dealt neither with the standing and sitting of people of different ages in confined spaces, nor with behaviour associated with the use of white sheets. The reason for the latter is that these artefacts are not used on JJ. These differences posed some problems and forced the Deductive team to devise a new theory, in fact, a set of theories, one for each research question. They did get some help from a JJan theory about sitting and standing in open spaces, but it was younger JJan's who were more likely than older ones to stand in such spaces. After much discussion, they were able to formulate three theories as arguments based on a logically related set of propositions. The first was on 'The Predominance of Younger Earthlings in Confined Spaces', the second on 'Sitting and Standing', and the third on 'Activity and Inactivity'. Only the first theory is reported here.

Theory A: On the Predominance of Younger Earthlings in Confined Spaces

- 1 Life on Earth in open spaces is nasty, brutish and short.
- 2 Few Earthlings survive beyond ten 'rounds'.¹⁰
- 3 In order to ensure their survival, younger Earthlings are required to spend most of their time in confined spaces.
- 4 As the survival of societies on Earth requires that some Earthlings spend time in open spaces, this is done during mid-life.
- 5 Those few Earthlings that survive their brief time in open spaces are allowed to return to the protection of confined spaces in their final 'rounds'.
- 6 Therefore, there are more younger than older Earthlings in confined spaces.

This theory was based on a meta-theoretical perspective about the physical conditions of JJan survival, and this was adapted to suit the Earthly context. They were not sure why Earthlings needed to spend time in open spaces or whether the reasons for a short life in open spaces would be the same as on JJ. However, they found the logic of the theory to be satisfactory and considered it to be worth testing. To do this, they predicted that in all the confined spaces on the university campus, young Earthlings would far outnumber older ones. While they were aware that the exploratory party had found some small confined spaces that did not conform to their prediction, they expected that this anomaly was simply an aberration in the selection of the places in which observations had been made.

To test the theory, they assigned two of their members to visit all confined spaces twice each 'lark', once during the 'light' and once during the 'dark'. The 'lights' and 'darks' were divided into ten equal intervals¹¹ within which an observation was to be made. The observation time for each space was randomized, and observations were

¹⁰ JJan's refer to the completion of an orbit of their planet around their sun as a 'round'. While they suspected that an Earthly 'round' might be shorter in length, for the moment they had no choice but to use the length of a JJ 'round' in their theory.

¹¹ These intervals corresponded to the way that JJan 'lights' and 'darks' were subdivided. It did not occur to these researchers that Earthlings worked with different intervals, or that the 'chimes' were a universal measure of time on Earth.

made for a period of twenty 'larks'. The observers were instructed to count the older and younger Earthlings present at the time. Ratios of older to younger Earthlings would then be calculated for each interval, for each space, for each 'lark', as well as for the grand total of all spaces.

The Deductive team found abundant evidence consistent with their theory about the different ratios of older and younger Earthlings in confined spaces. However, they discovered that the ratios varied depending on the sizes of the confined spaces; the larger the space the higher the ratio. In general, they found that there was only one older Earthling to many younger Earthlings in all the spaces, except in the very small ones. The exception that they had observed in their exploratory research turned out not to be an aberration. In these very small spaces the older Earthlings were usually found on their own, or, if not, the ratio was usually 1 : 1.

The Deductive team believed that by testing their conclusion to this theory they had tested the theory itself. After all, the conclusion had been derived logically from the abstract 'theoretical' premises; the premises cannot be false if the conclusion is true. They considered that the exception to the theory that was found in the very small spaces could be explained in terms of the few older Earthlings that had survived their time in open spaces being given a small space as a secure place in which to live. They were visited occasionally by younger Earthlings. What the Deductive team had failed to notice was that the older Earthlings were usually only in these small spaces during the 'lights'. This was because they had no similar situations on JJ that would have led them to expect fluctuating occupancy of such spaces.

The Retroductive team

Like the Deductive team, the Retroductive team also needed to begin its research with detailed descriptions of the regularities or patterns in Earthling behaviour and social interaction. Hence, they decided to join forces with the Deductive team for the first stage of their research. They were interested in the external manifestations of regularities in Earthling behaviour. Therefore, their descriptions of the behaviour of Earthlings in confined spaces were identical to those of the Deductive team. However, when it came to explaining this behaviour, the Retroductive team parted company with their colleagues. They believed that explanations had to be found in different places, using a different logic, that is, in the real structures and mechanisms that are responsible for producing observed regularities. They believed that these structures and mechanisms have an existence independent of social scientists. As these structures and mechanisms are not usually susceptible to direct observation, their nature and function has to be first imagined, or modelled, and then evidence for their existence sought. The process of building the model involves working back from the data obtained about the observable reality in order to hypothesize what the underlying reality might be like.

The Retroductive team postulated that Earthling society was based on a structure of power relations between younger and older members. Because the younger members outnumbered the older members, they could control the latter. This was based on the analogy that dominance among animals on JJ was always based on superiority of numbers and the fitness of younger animals.

The initial evidence for the truth of this model was that in the spaces where older and younger Earthlings meet, it appeared that the older Earthlings were being interrogated by groups of younger Earthlings. Perhaps they were being required to answer for their misdeeds while they were in the open spaces. Just as the exploratory party had found, the Deductive and Retroductive teams observed that when the older Earthlings were not with the younger Earthlings in the various spaces, they were to be found mainly on their own in their small spaces. They assumed that these were cells, although they did not seem to be locked and they had not seen any guards.

The Retroductive team's conception of this underlying power structure was reinforced by their interpretation of what was going on in some of the specialized spaces. Again, it appeared that the cases against the older Earthlings were being prepared and their answers to the questions were being taken from their white sheets and entered into a computer database.

The team then set about trying to establish the existence of these underlying structures by methods that are more systematic. They sought the permission of the university authorities to conduct an experiment in which two older Earthlings and twenty younger ones would be asked to volunteer to undertake problem-solving tasks. Their request was granted and a relatively small space was allocated for the purpose. However, before they could proceed with the experiment, they had to improve their command of the language in order to give the Earthlings instructions about the task. As the data were collected by observation only, it was not necessary to communicate with the Earthlings to produce their data.

The Earthlings were divided into two groups, one older and ten younger Earthlings in each one. Each group was set a different task and observations were made of the power relations that emerged. In both cases, it was the older Earthling that emerged as the leader and the decision-maker; the younger ones deferred to it and rarely challenged its authority.

The results of this experiment forced the Retroductive team to rethink their model of the underlying structure in Earthling society. As it did not appear to fit with their earlier attempt to understand the observed reality, they were forced to look at it differently and to postulate a different model. This time they based their model of the underlying structure on the universal idea held in JJan society that 'wisdom is power'. Their age and their outside experience would have provided the older Earthlings with superior wisdom. To test this idea, they devised a 'wisdom test' for the Earthlings, based on the one used on JJ. However, to adapt it, a great deal of work was required to establish what Earthlings regarded as wise judgements.

The test was administered to a random sample of both age groups. They were able to establish the wisdom superiority of the older members. This, together with their experimental evidence, gave them confidence in the existence of the underlying wisdom structure. They were then able to explain much of the observed behaviour of the Earthlings.

The Abductive team

The fourth team rejected the ways in which the Inductive and Deductive teams went about their research. They were interested in what the exploratory party had found

but did not trust the methods they had used. Instead of just observing behaviour, the Abductive team considered that it was vital to find out how the Earthlings themselves interpret what they are doing; to grasp Earthling social reality as Earthlings understand it; to discover the everyday knowledge that they use in their social interaction. This team believed that social reality is socially constructed by the groups of people who inhabit it; it is *their* reality, not reality as conceived by researchers. Therefore, any descriptions of social reality must be based on the way it is viewed by the participants, not just the way it is viewed by the outside observer. This meant that the Abductive team needed to use very different methods to conduct their descriptive research. They needed to produce an account of the activities of the Earthlings in these confined spaces as they are 'known' to the participants. In short, they needed to talk to the Earthlings to discover their construction(s) of social reality.

The team assumed that they would encounter the same difficulties on Earth that they had to face on JJ. In particular, they expected that Earthlings would also live in largely taken-for-granted worlds, and, therefore, would not always be able to articulate the motives for their actions.

The need to discover these motives, and, more generally, the social stock of knowledge that Earthlings use in their everyday lives, posed a serious problem for the Abductive team, as their capacity to communicate with the Earthlings was very limited. They needed time to learn the Earthlings' form of communication and to discover something about their culture. The other social research teams were fully aware of this requirement and the additional time needed to do it; this had been built into the schedule for the expedition very reluctantly. The lack of sympathy from the other teams concerning this requirement was based on the extra costs involved. There had been a move to exclude this team from the expedition because of this, but a compromise was reached that allowed the members of the other three teams some time for sightseeing if they had finished their research early.

The Abductive team approached the university authorities and, after difficult negotiations, managed to get approval to spend four 'chimes' each day with a group of Earthlings who were expert in teaching the Earthling language that was used on the campus. For as much of the rest of each 'lark' that they could manage, the members of this team met with Earthlings to practise what they had learnt. As a very experienced Abductive team had been chosen for the expedition, they were able to pick up the rather primitive verbal language of the Earthlings very quickly.

The process of learning the language provided the Abductive team with the opportunity to begin to explore the concepts and meanings associated with activities in confined spaces, and, as language proficiency improved, this first stage of the research gathered momentum. The Abductive team set themselves some general questions.

What do Earthlings say is going on in these enclosed spaces?

What do the Earthlings say they are trying to achieve there?

As the research proceeded, they expected that these questions would be refined and supplemented.

The Abductive team began to discover a range of concepts that the Earthlings used to talk about their activities. In their conversations among themselves, the younger

Earthlings talked about going to 'lectures', to 'classes', to 'tutorials', to 'pracs', to 'labs', and to the 'library', the 'union', the 'cafe' or the 'canteen'. The younger Earthlings referred to themselves as 'students' and to the older Earthlings as 'lecturers' or 'professors'. They met together regularly in 'lecture theatres' and 'classrooms', and, occasionally, in a 'lecturer's' 'office', either one-to-one or in small groups, for 'consultations'. They also talked about 'assignments', 'essays', 'papers', 'tests', 'exams', 'marks' and 'grades', usually with a high level of anxiety. As these commonly used concepts were recorded, the Abductive team began to ask the Earthlings what they meant by them, and when and how they use them. Gradually, they began to piece together a core of shared meanings. However, they began to notice that the older and younger Earthlings did not always mean the same thing by some of the concepts. For example, they had different ideas about what 'lectures' were for, the younger ones seeing them mainly as providing clues about what they should learn for the 'exam', while the older ones talked about 'intellectual development' and 'critical thinking'.

The Abductive team recorded all their conversations with the Earthlings by means of their wrist computers. Later they made time to listen to the recordings, to search for common meanings, and to find gaps in their emerging understanding that might require further informal questioning. As this analysis proceeded, the Abductive team began to redescribe, in JJ social scientific language, what the Earthlings told them about their everyday reality. For example, they discussed abstract ideas about different processes of 'education', 'learning' and 'training' that went on in the enclosed spaces; they discussed the quality of the relationships between the 'lecturers' and the 'students' and how this is linked to 'learning'; and they discussed issues such as 'academic standards' and 'accountability'. In the end, they managed to produce very detailed accounts of the social realities present in this area of social life on Earth, both in the language of the participants, and in their own more abstract technical language. In the process, they began to produce descriptions of typical Earthlings who engaged in typical activities in typical social contexts. They found three types of younger Earthlings that they labelled as 'scholars', 'bludgers' and 'pragmatists'. The 'scholar' they saw as being interested in 'learning' for its own sake, the 'bludger' as engaging in the activities with the minimum of effort and the maximum of short-cuts, including getting as much help as possible, and the 'pragmatist' as engaging in the activity as a means to the end of security and advancement in the future. Similarly, other typologies were established to describe typical differences between 'lecturers' and 'students' and for the variety of confined spaces in which activities on campus took place.

While they were not able to produce a complete picture of all that went on in these confined spaces, they were able to understand a great deal, for example, the different motives and goals of the participants, and the variations in the nature of the social interaction. They could begin to answer their research questions. Their curiosity about this aspect of Earthly life had been largely satisfied, although they were aware that they had but scraped the surface.

We must leave the JJan research teams for the time being. In chapter 7 we will hear about the results of their research and their attempt to establish which is the best research strategy.

Four Research Strategies

The 'Parable of Four Paradigms' should have provided some clues about the core features of the four main strategies of social research available in the social sciences. However, before elaborating them, it is important to note that they must be regarded as ideal or constructed types (Patton 1988; Smaling 1994). They have been derived from the work of many writers and practitioners to identify clusters of characteristics that are typical of approaches to social research, and which highlight the differences between them. While the views of some writers may come close to the descriptions of the characteristics of each typical research strategy, other writers may not fit as well. Some writers may even include a mixture of the types in their work. The descriptions of these typical strategies are abstractions that are designed to make it possible to cope with the diversity of views and practices. They are heuristic tools rather than descriptions of watertight categories that researchers occupy, but, nevertheless, tools that have been derived from such descriptions. This distinction between abstraction and description makes it possible to use the research strategies to compare the writings or research of both theorists and practitioners. The four ideal types also allow for the possibility that a combination of two or more may occur in practice.

The method used to produce the research strategies partly follows the one described in this chapter as the *abductive* strategy, as it is applied to the analysis of texts. It allows for the possibility that other ideal typical research strategies may have existed in the past, and may exist now or in the future. Attempts to typify any aspect of the natural or social worlds are constrained by the range of resources available or selected. Therefore, while I am confident that these four research strategies broadly encompass the logics of enquiry that are available to social researchers, it is possible that other distinctive strategies have been used, are used now, or will be used in the future.

The research strategies provide different ways of answering research questions by specifying a starting-point, a series of steps and an end-point. It is the particular character of these points and steps that distinguishes the strategies. The *inductive* strategy starts with data collection, followed by data analysis, and then the development of generalizations that, with further testing, can become law-like propositions to be used to explain aspects of social life. The *deductive* strategy works in the reverse order. It begins with an observed regularity that needs to be explained; a tentative theory is acquired or constructed; then hypotheses are deduced and then tested by collecting appropriate data. Similarly, the *retroductive* strategy begins with an observed regularity, but this is followed by the construction of a hypothetical model of a possible structure or mechanism that could have produced this regularity. By observation and experiment, a search is then undertaken to establish whether the explanatory structure or mechanism exists. The *abductive* strategy begins by exploring through everyday language the knowledge that social actors use in the production, reproduction and interpretation of the phenomenon under investigation. This is followed by a redescription of this everyday account into a social scientific account, and, possibly, into a grounded explanation (see table 4.1).

Table 4.1 The logic of four research strategies

	Inductive	Deductive	Retroductive	Abductive
Aim	To establish universal generalizations to be used as pattern explanations	To test theories to eliminate false ones and corroborate the survivor	To discover underlying mechanisms to explain observed regularities	To describe and understand social life in terms of social actors' motives and accounts
From	Accumulate observations or data	Borrow or construct a theory and express it as an argument	Document and model a regularity	Discover everyday lay concepts, meanings and motives
	Produce generalizations	Deduce hypotheses	Construct a hypothetical model of a mechanism	Produce a technical account from lay accounts
To	Use these 'laws' as patterns to explain further observations	Test the hypotheses by matching them with data	Find the real mechanism by observation and/or experiment	Develop a theory and test it iteratively

Each strategy has a philosophical and theoretical ancestry and foundation, and includes ontological assumptions about the nature of reality and epistemological assumptions about how that reality can be known. Only four major approaches to social enquiry are referred to here. For a detailed discussion of these and another seven approaches, see Blaikie (1993a) (see also Guba and Lincoln 1994). While there is overlap between the strategies on some of these, each has a unique combination. *Induction* is the logic of Positivism, the view of science propounded by Bacon (1620) and Mill (1879) in the period of the development of the natural sciences and, later, by Durkheim and others during the establishment of the social sciences. *Deduction* is the logic of Critical Rationalism, the alternative to Positivism developed by Popper in the 1930s. *Retroduction*, the logic of transcendental or Scientific Realism, has been advocated by Bhaskar and Harré as an alternative to both Positivism and Critical Rationalism; its proponents claim that it characterized good science from the beginning. *Abduction* has a long ancestry and comes in many versions; it has links with hermeneutics and social phenomenology and is based on various branches of Interpretivism, particularly the work of Schütz and Giddens.

Readers familiar with the broad range of social scientific approaches included under the label of 'Interpretivism' will recognize that I am advocating a particular 'middle-of-the-road' version which owes much to Weber, to contemporary hermeneutics, to the social phenomenology of Schütz, and to Winch, Rex,

Douglas and Giddens. What characterizes this particular version of Interpretivism is that, while it has a strong hermeneutical foundation, it does not eschew the possibility of developing and testing theory, but theory with time and space limitations (for further elaboration, see Blaikie 1993a).

The research strategies have been constructed so that the logic of enquiry used in each one is incompatible with the logics of the other three. This does not preclude the possibility that strategies may share common ontological assumptions. For example, the *inductive* and *deductive* strategies share the same ontology, and one version of the *retroductive* strategy shares the ontology of the *abductive* strategy (see e.g. Harré and Secord 1972). Nor does it preclude the possibility that they can be combined in practice, for example being used in sequence, as has been advocated for the *inductive* and *deductive* strategies by Wallace (1971, 1983) and de Vaus (1995) (see chapter 5).

These strategies and their foundations will now be examined. (For a more detailed review of the research strategies and their philosophical foundations, see Blaikie 1993a.)

Inductive Research Strategy

The *inductive* strategy is the commonsense view of how scientists go about their work. According to this view, meticulous and objective observation and measurement, and the careful and accurate analysis of data, are required to produce scientific discoveries. Bacon saw science as based on presuppositionless observation; by clearing the mind of all prejudices, the book of nature is to be read with fresh eyes (O'Hear 1989: 16). J. S. Mill, believing that the purpose of science was to establish general laws, proposed an elementary experimental method to identify possible causes and effects. Again, these causes are to be discovered by unprejudiced observation.

Positivism, on which the *inductive* strategy is based, entails *ontological assumptions* about an ordered universe made up of discrete and observable events. It assumes that this order can be represented by universal propositions, i.e. by generalizations about the relationships between concepts. Only that which can be observed, that is, experienced by the senses, can be regarded as real and therefore worthy of the attention of science. *Social reality* is viewed as consisting of a complex of causal relations between events. This is usually represented as an emerging network of relations between concepts. The causes of human behaviour are regarded as being external to the individual.

In its *epistemological assumptions*, knowledge is considered to be produced through the use of the human senses and by means of experimental or comparative analysis. The senses produce 'observations' or data. Concepts, and generalizations about their relationships, are regarded as shorthand summaries of particular observations. Trained humans are assumed to be able to produce 'objective' data. By adopting 'objective' observation procedures, it is assumed that reality can be recorded accurately. Hence, a correspondence is considered to exist between the record of 'objective' observations and the things that are observed. What you see is what is there. Regularities that are recorded

through such observation are the basis for scientific laws. In other words, statements based on 'objective' observations become theoretical statements about the order in reality.

The *inductive* strategy has been described as consisting of three principles: accumulation, induction, and instance confirmation. Scientific knowledge consists of well-established regularities that are arrived at by the accumulation of much data. General laws are produced by applying inductive logic to the carefully accumulated observations and experimental results. The plausibility of any general law is proportional to the number of instances of it that have been observed (Harré 1972: 42). Hence, the researcher must begin by setting aside all preconceptions about how the world works and then proceed to gather data using 'objective' methods. Inductive logic is used to produce generalizations about the patterns or regularities that exist in the data obtained. The greater the number of instances of the regularity that has been observed, the greater is the confidence that the generalization corresponds to the timeless uniformities in the world.

The *inductive* strategy has also been characterized as consisting of four main stages.

- 1 All facts are observed and recorded without selection or guesses as to their relative importance.
- 2 These facts are analysed, compared and classified, without using hypotheses.
- 3 From this analysis, generalizations are inductively drawn as to relations between the facts.
- 4 These generalizations are subjected to further testing (Wolfe 1924: 450; Hempel 1966: 11).

The inductive strategy has been subjected to extensive criticism. The following of its claims have been contested:

- that preconceptions can be set aside to produce objective observations;
- that 'relevant' observations can be made without some ideas to guide them;
- that inductive logic has the capacity to mechanically produce generalizations;
- that universal generalizations can be based on a finite number of observations; and
- that establishing regularities is all that is necessary to produce explanations.

The uses of the concepts of 'objectivity', 'facts' and 'truth' have also been challenged. See chapters 4 and 5 of Blaikie (1993a) for a critical review, and Popper (1959, 1961), Hempel (1966), Medawar (1969), Hindess (1977) and Chalmers (1982) for general critiques.

In the light of these criticisms, it is necessary to make some amendments to the 'pure' form of the inductive research strategy in order for it to be useful in the social sciences today. Given that presuppositionless data collection is impossible, concepts, and the theoretical baggage that goes with them, are required before any observations or measurements can be made. The choice of concepts, and the way they are defined, will predetermine what data are collected. Therefore, the researcher will begin with some preconceptions and choices about what will be

observed. While this procedure infringes the original requirements for the research strategy, if the definitions of the concepts are made explicit the conclusions can be evaluated in terms of them, and other researchers can attempt to replicate the findings.

With these modifications, the inductive strategy can be used for two purposes: to pursue exploratory and descriptive objectives to answer 'what' questions, i.e. to describe phenomena and establish regularities which need to be explained; or to pursue an explanatory aim, i.e. to discover laws or very general regularities that can be used to explain observed regularities. The limitations of this form of explanation, referred to as 'pattern explanation', will be discussed later.

In addition to its use in producing generalizations of characteristics or patterns from data accumulated within a project, the logic of induction can also be used across studies. Replication studies can be used to extend generalizations about characteristics and patterns. Cook (1998) has argued that attempts to establish the generality of a causal explanation must rely on *induction*. The process of random selection of respondents, or the random assignment of subjects to groups (as in experimental research), is always limited by the definition of the population from which the selection is made. The same limitations apply to the selection of units of analysis, measures of concepts, places, times, etc., to which random selection is rarely applied. The only way to go beyond these limitations is to use the logic of *induction*, to generalize from the results of different studies, assuming that the results are consistent.

Because induction is not a 'perfect' logic, all attempts to generalize must be tentative. In other words, consistent findings can support a generalization but never prove it to be true. Hence, in spite of the claims of some of its advocates, the status of the knowledge produced using the *inductive* research strategy must always be regarded as being subject to revision; further research may reveal contrary findings. Therefore, as we shall see, the status of knowledge derived from both the *inductive* and *deductive* research strategies is similar. (See Research Design 1 in chapter 8 for a practical application of the *inductive* strategy.)

Deductive Research Strategy

Notions of deduction go back to antiquity, to Euclidean geometry and Aristotelian logic. Known also as the hypothetico-deductive method, or falsificationism, the *deductive* strategy was developed by Popper, the founding father of the philosophy of science known as Critical Rationalism.¹² It is his attempt to overcome the deficiencies of Positivism and the *inductive* strategy. The core of his argument is that, as observations do not provide a reliable foundation for scientific theories and as inductive logic is flawed, a different logic is needed for developing theories. His solution was to accept that all data collection is selective

¹² Guba (1990) and Guba and Lincoln (1994) have identified a similar enquiry paradigm that they have labelled 'postpositivism'. However, they, unlike Phillips (1990), have not fully acknowledged Popper's (1959, 1972) contribution to it.

and involves interpretation by the observer, and then to develop an appropriate logic that is the reverse of that advocated by Positivism.

According to Popper (1972: 47), observations are always made from a point of view, with a frame of reference, with a set of expectations, thus making the notion of presuppositionless observation impossible. To collect any useful data, it is necessary first to have some ideas about what to look for. It is necessary to have some tentative answers to 'why' questions, some hypotheses that have been derived from a theory, to provide direction for data gathering. Then, rather than accumulating data, as in the *inductive* strategy, data are used to test the tentative answers. The aim is to see if the data match the hypotheses. Ideally, what the researcher would like to be able to develop is a theory that matches the behaviour of the phenomenon under study, i.e. a theory that matches reality. However, according to Popper, reality cannot be observed directly; all that can be done is to try to match the theory with the data.

The *deductive* research strategy derives its *ontological and epistemological assumptions* from Critical Rationalism; it shares some aspects of Positivism's ontological assumptions but rejects its epistemological assumptions. Nature and social life are regarded as consisting of essential uniformities, i.e. patterns of events. It is the aim of science to discover these uniformities, to find universal statements that are true because they correspond to the facts of nature, or, more correctly, to descriptions of observed states of affairs. However, the use of the senses is rejected as a secure foundation for scientific theories.

Critical Rationalism makes no distinction between observational and theoretical statements; all observations are considered to be theory-dependent and to occur within a 'horizon of expectations'. In other words, collecting any kind of data involves the use of some theoretical ideas; concepts about which data are collected have theoretical ideas associated with them. Data collection occurs against the background of certain expectations about what exists and how it behaves.

In this approach to the generation of new knowledge, data are used in the service of deductive reasoning, and theories are invented to account for observations, not derived from them. Rather than scientists waiting for the social world to reveal its regularities, they must impose theories on the world and, by a process of trial and error, use data to try to reject false theories. Theories that survive this critical process are provisionally accepted, but never proven to be true. All knowledge is tentative and subject to ongoing critical evaluation.

This view of the role of observation or data collection is accompanied by a different kind of logic. Instead of looking for confirming evidence to support an emerging generalization, as occurs in the inductive research strategy (known as 'justificationism'), Popper argued that the aim of science is to try to refute the tentative theories that have been proposed. The search for truth is elusive because we have no way of knowing when we have arrived at it. All that can be done is to eliminate false theories by showing that data do not fit with them. Theories that survive the testing process are not proven to be true as it is still possible that further testing will find disconfirming evidence; it may be necessary to discard the theory, or at least modify and retest it. Therefore, science is a process of conjecture and refutation, of trial and error, of putting up a tentative theory, and then endeavouring to show that the theory is false. The fittest theories will survive.

Popper's argument can be summarized as follows.

- The natural and social worlds consist of essential uniformities.
- The aim of science is to establish generalizations that correspond to these uniformities and theories that explain them.
- However, it is not possible ultimately to establish whether such generalizations or theories are true, i.e. that they correspond with reality.
- All that can be done is to eliminate false theories, thus getting closer to the truth.
- But we never know when we have arrived at true theories.
- Therefore, all theories that have survived testing, i.e. that have been *corroborated*, must remain tentative; they may be replaced in the future by better theories.

According to Popper, the *deductive* research strategy has a number of essential steps.

- 1 Begin by putting forward a tentative idea, a conjecture, a hypothesis or a set of hypotheses that form a theory.
- 2 With the help, perhaps, of other previously accepted hypotheses, or by specifying the conditions under which the hypotheses are expected to hold, deduce a conclusion, or a number of conclusions.
- 3 Examine the conclusions and the logic of the argument that produced them. Compare this argument with existing theories to see if it constitutes an advance in our understanding. If you are satisfied with this examination, then:
- 4 Test the conclusion by gathering appropriate data; make the necessary observations or conduct the necessary experiments.
- 5 If the test fails, i.e. if the data are not consistent with the conclusion, the theory must be false. If the original conjecture does not match the data, it must be rejected.
- 6 If, however, the conclusion passes the test, i.e. the data are consistent with it, the theory is temporarily supported; it is *corroborated*, but not proven to be true (Popper 1959: 32–3).

An example of what a deductive theory might look like comes from a reconstruction of Durkheim's theory of egoistic suicide. It consists of five propositions using three main concepts: 'suicide rate' (the number of suicides per thousand of a population); 'individualism' (the tendency of people to think for themselves and to act independently, rather than to conform to the beliefs and norms of some group)¹³; and 'Protestantism' (a collection of Christian religious groups formed following the Reformation and the subsequent fragmentation of Roman Catholicism).

¹³ An alternative concept is 'social integration', which refers to the acceptance and practice of a group's beliefs and norms by its members. Durkheim discussed what he called a spirit of free enquiry that some religious groups may encourage, and which can lead to schisms within the group. In contrast, other groups require strict adherence to beliefs and practices and this has the consequence of socially integrating its members.

- 1 In any social grouping, the suicide rate varies directly with the degree of individualism (egoism).
- 2 The degree of individualism varies directly with the incidence of Protestantism.
- 3 Therefore, the suicide rate varies with the incidence of Protestantism.
- 4 The incidence of Protestantism in Spain is low.
- 5 Therefore, the suicide rate in Spain is low (Homans 1964: 951).

The theory contains two universal propositions (1 and 2) which state the form of relationships between pairs of concepts. The meaning of each proposition could be elaborated and reasons given for including it. The third proposition follows logically from the first two and links the suicide rate with 'Protestantism', a less abstract concept than 'individualism'. On its own, each proposition explains nothing, but all three propositions together constitute an explanation for differences in suicide rates. What Durkheim wanted to explain was why Protestants have a higher suicide rate than Catholics; he claimed that these propositions provide such an explanation. The addition of proposition 4, a descriptive statement, allows for a prediction (proposition 5) that can be tested (assuming that relative suicide rates can be satisfactorily established). Similarly, predictions could be made about other countries (e.g., Republic of Ireland) to provide further tests of the theory. Alternatively, if proposition 5 needs to be explained, then the preceding propositions provide the explanation. In this particular theory it would be possible to test propositions 1 to 3 directly by gathering data on these pairs of concepts in various populations. Hence, when theories are structured in this deductive way, the differences between explanation, prediction and testing, as Popper has argued, is just a matter of emphasis. (Blaikie 1993a: 149)

Critical Rationalism and its *deductive* research strategy have also been severely criticized. The following list includes the major criticisms:

- If observations are interpretations, and we can never observe reality directly, how can regularities be established confidently and theories be refuted conclusively?
- The tentative acceptance of a yet unrefuted theory requires some inductive support.
- There is no interest in where tentative theories should come from, or how they might be constructed.
- Science needs to be less logical to allow for chance discoveries.
- Paying too much attention to logic can stifle scientific creativity.
- The process of accepting or rejecting theories involves social and psychological processes, not just logical ones.

See chapters 4 and 5 of Blaikie (1993a) for a critical review, and Hesse (1963, 1974), Medawar (1969), Kuhn (1970), Lakatos (1970), Hindess (1977), Chalmers (1982), Salmon (1988a, 1988b, 1988c), O'Hear (1989) and Pawson (1989) for specific critiques or suggested amendments. (A practical application of the deductive strategy can be found in chapter 8, Research Design 2.)

Retroductive Research Strategy

The *retroductive* strategy is the logic of enquiry associated with the philosophical approach of Scientific Realism, or, more particularly, the transcendental Realism of Bhaskar and the constructivist Realism of Harré. These authors have been very critical of both Positivism and Critical Rationalism and have presented what they consider to be a superior ontology, and a more appropriate logic of enquiry.

Scientific Realism is distinguished from other approaches to social enquiry by its particular ontology. In the Realist *ontology*, the ultimate objects of scientific enquiry are considered to exist and act independently of scientists and their activity. A distinction is made between the domains of the empirical, the actual and the real: the *empirical* domain consists of events that can be observed; the *actual* domain consists of events whether or not they are observed; and the *real* domain consists of the structures and mechanisms that produce these events. It is an ontology of intransitive structures and mechanisms that are distinguished from transitive concepts, theories and laws that are designed to describe them. These structures and mechanisms are the real essences of things that exist in nature, such essences being their power or tendency to produce effects that can be observed.

Social reality is viewed either as a socially constructed world in which social episodes are the products of the cognitive resources social actors bring to them (Harré 1977), or as social arrangements that are the products of material but unobservable structures of social relations (Bhaskar 1979). The aim of Realist science is to explain observable phenomena with reference to underlying structures and mechanisms.

Realist *epistemology* is based on the building of models of mechanisms such that, if they were to exist and act in the postulated way, they would account for the phenomena being examined. These models constitute hypothetical descriptions that, it is hoped, will reveal the underlying mechanisms. In other words, these mechanisms can only be known by constructing ideas about them. This is an epistemology of laws as expressing tendencies of things, as opposed to the conjunctions of events advocated by Positivism.

Bhaskar rejected Positivism's pattern model of explanation, i.e. that explanation can be achieved by establishing regularities, or constant conjunctions, within phenomena or between events. Both Bhaskar and Harré have argued that establishing such regularities is only the beginning of the process. What is then required is to locate the structure or mechanism that has produced the pattern or relationship. These structures and mechanisms are nothing more than the tendencies or powers of things to act in a particular way. The capacity of a thing to exercise its powers, or the likelihood that it will, depends on whether or not the circumstances are favourable.

This view of causation allows for the possibility that competing or cancelling mechanisms may be operating when no event or change is observed, i.e. lack of movement may be due to opposing forces at work. Therefore, the independence of an event and its associated structures or mechanisms can be demonstrated.

Bhaskar's brand of Realism consists of five principles (Outhwaite 1987: 45–6):

- 1 A distinction is made between *transitive* and *intransitive* objects of science. Transitive objects are the concepts, theories and models that are developed to understand and explain some aspects of reality, and intransitive objects are the real entities and their relations that make up the natural and social worlds.
- 2 Reality is stratified into three levels or domains, the empirical, the actual and the real.
- 3 Causal relations are regarded as powers or *tendencies* of things that interact with other tendencies such that an observable event may or may not be produced, and may or may not be observed. Social laws need not be universal; they need only represent recognized tendencies. This view contrasts with the Positivist view in which causal laws are regarded as universal connections between events.
- 4 In the domain of the real, definitions of concepts are regarded as *real definitions*, i.e. statements about the basic nature of some entity or structure. These are neither summaries of what is observed nor stipulations that a term should be used in a particular way.
- 5 Explanatory *mechanisms* in the domain of the real are postulated, and the task of research is to try to demonstrate their existence.

The logic of the *retroductive* strategy has some similarities to that of the *deductive* strategy, but there are also important differences. Both commence with an observed regularity that requires an explanation. Harré regarded this first stage, labelled *empirical studies*, as involving both 'exploration', to extend what is known by common observation, and 'experiment', to check critically the authenticity of what is thought to be known. A researcher may have some idea of the direction to go in this exploration but no clear idea of what to expect. This is followed by a second stage, labelled *theoretical studies*, which is concerned with producing an explanation for the regularity established by the empirical study. Explanation is achieved by identifying the generative mechanisms that produced the regularity (Harré and Secord 1972: 69–71).

When these structures and mechanisms have not been observed previously, they are initially proposed as hypothetical entities. The researcher 'uncovers' them by first constructing a hypothetical model of their nature and tendencies. This model building is a creative activity involving disciplined scientific imagination and the use of analogies and metaphors. If the mechanism exists and acts in the postulated way, it would explain the regularity (Bhaskar 1979: 15). Put rather too simply, the researcher's task is then to establish whether the mechanism exists. This may involve testing predictions based on the assumption that it does exist, and perhaps devising new instruments to observe it. The major value of the hypothetical model is that it gives direction to the research; the *retroductive* researcher, unlike the *inductive* researcher, has something to look for.

Many searches for explanatory mechanisms will have been unsuccessful, or only partially successful. In the natural sciences, successful examples are the discovery of the elliptical orbits of the planets of the solar system, and the existence of atoms and viruses. They all began as ideas in the minds of their

discoverers and could not have been produced by accumulating data. The process used to establish their existence was slow and painstaking.

Constructing models of mechanisms may involve the use of analogies. Analogies involve borrowing ideas from other fields with which the researcher is familiar, and transferring the principles to the area being investigated. A natural science example of this can be found in the early stages of the process of understanding electricity when the analogy of water flowing in pipes was used. In the social sciences, a classical example is to be found in a number of theories that regard societies as being like huge organisms. The extent to which such analogies are fruitful is a matter of experience and usually much debate; some, like the organismic analogy, while initially useful, eventually imposed limits on understanding. (See chapter 6 for a discussion of the use of analogies as models.)

Scientific method, as it is practised in the advanced sciences, consists then of the exploration of certain fields of natural phenomena in the attempt to discern non-random patterns in those fields, and critically to check them. This is followed, accompanied, or even preceded by the work of the creative imagination, in the course of which iconic models of the generative mechanisms at work in the field of natural phenomena are conceived. The invention of such models is essential to the scientific enterprise and their appearance is what distinguishes real science from critical description, for it is through them that we come to form some idea of why events happen as they do, and why things manifest the structures, powers and qualities that they do. (Harré and Secord 1972: 76-7)

The *retroductive* research strategy can be summarized as follows.

- 1 In order to explain observable phenomena and the regularities that obtain between them, scientists must attempt to discover appropriate structures and mechanisms.
- 2 Since these structures and mechanisms will typically be unavailable to observation, it is necessary to first construct a model of them, often drawing upon already familiar sources.
- 3 A model is such that, were it to represent correctly these structures and mechanisms, the phenomena would then be causally explained.
- 4 The model is then tested as a hypothetical description of actually existing entities and their relations. To do so, it is necessary to work out further consequences of the model (that is, additional to the phenomena to be explained), that can be stated in a manner open to empirical testing.
- 5 If these tests are successful, this gives good reason to believe in the existence of these structures and mechanisms.
- 6 It may be possible to obtain more direct confirmation of these existential claims, by the development and use of suitable instruments.
- 7 The whole process of model-building may then be repeated, in order to explain the structures and mechanisms already discovered (Keat and Urry 1975: 35; Harré 1961).

However, the *retroductive* strategy requires more than the discovery of mechanisms. A mechanism produces a regularity only under certain conditions; i.e. a

pattern or regularity will be generated only if the conditions are conducive. The social conditions in which a social episode occurs, or within which any social group or community exists, is not entirely the result of the activities of the participants. This means that social actors may have little or no awareness of the mechanisms, and, in particular, the structures, which are involved in the production of the regularities in their social activities.

The notion of *retroduction* appears to be more easily applied in the natural sciences than in the social sciences. There is a dearth of social research that has explicitly used retroductive logic. However, as has been done in the natural sciences, it is possible to reconstruct classic studies in the social sciences within the retroductive strategy. There are probably many reasons for the lack of use of this research strategy, an important one being the different character of mechanisms in the social sciences (see Blaikie 1994, 1996). In the natural sciences, *retroduction* is used to search for unknown and more 'fundamental' underlying phenomena.

The chemistry of substances demands the mechanisms of atoms, the physics of atoms demands the mechanisms of proton and electron structures, the physics of these entities demand the mechanisms of quarks, and so on, extending as far as technological proficiency and human ingenuity can lead. (Harré and Secord 1972: 77)

In the social sciences, as the nature of explanatory mechanisms is usually well known, the task becomes one of discovering which of a number of possible mechanisms is responsible for producing a particular regularity. The structuralist version of Scientific Realism in the social sciences hypothesizes the role of an underlying social structure, such as a Marxian version of the class structure. The constructivist version assumes that regularities in social behaviour are the result of social actors following rules and conventions in a self-monitoring process. Thus, explanatory mechanisms consist of 'the rules, plans, conventions, images and so on that people use to guide their behaviour' (Harré and Secord 1972: 151).

In general social behaviour is the result of conscious self-monitoring of performance by the person himself [*sic*], in the course of which he contrives to assess the meaning of the social situations in which he finds himself, and to choose amongst various rules and conventions, and to act in accordance with his choice, correcting this choice as further aspects of the situation make themselves clear to him. (Harré and Secord 1972: 151)

Access to these rules and meanings is from participants' accounts. However, these mechanisms need to be distinguished from the reasons or justifications that social actors can also give for their actions.

Therefore, the arguments for hypothetical model building in the natural sciences do not seem to transfer well to the social sciences, where the notion of 'hidden' mechanisms has a rather different meaning. In the natural sciences, mechanisms are hidden because they reside in the *real* domain of reality that has still to be 'discovered'. If mechanisms in the social sciences are regarded as social constructions, then their 'hidden' character refers to the fact that the social researcher cannot observe them directly, and that social actors may not be aware of them. Hence, complex and sometimes time-consuming procedures are needed to

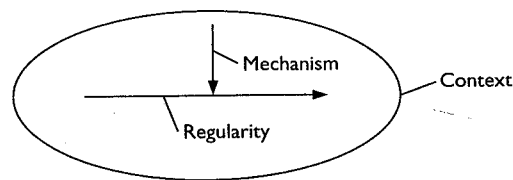


Figure 4.2 Realist social explanation

(Source: Pawson and Tilley 1997: 72)

unearth them. Social actors may have come to take them so much for granted that they are not readily 'available', and may even be unconscious. In spite of these difficulties, considerable knowledge of possible social mechanisms is available.

An important recent development in the application of the *retroductive* research strategy to the social sciences has been presented by Pawson and Tilley (1997). Drawing on Giddens's (1979, 1984) discussions of the duality of *agency* and *structure*, they have endeavoured to bring together elements of the *structuralist* and *constructivist* versions of realism. They have argued that explanation is not achieved by the action of independent variables on dependent variables, by the operation of intervening variables, or by the chain reaction of such variables. Rather, explanation of social regularities, rates, associations, outcomes or patterns come from an understanding of mechanisms acting in social contexts. *Regularity = Mechanism + Context* (see figure 4.2).

The basic task of social inquiry is to explain interesting, puzzling, socially significant regularities (*R*). Explanation takes the form of positing some underlying mechanism (*M*) which generates the regularity and thus consists of propositions about how the interplay between structure and agency has constituted the regularity. Within realist investigation there is also investigation of how the workings of such mechanisms are contingent and conditional, and thus [are] only fired in particular local, historical or institutional contexts (*C*). (Pawson and Tilley 1997: 71)

Pawson and Tilley have argued that all social regularities are embedded in a wider range of social processes, within different layers of social reality. For example, interaction between teacher and students occurs within a classroom, that is located within a particular school, that has a geographical location, with parents of particular social backgrounds, within a particular sector of educational administration, etc., etc. To understand the patterns of academic success in the classroom, these sectors of reality must be taken into account.

'Causal social mechanisms' refers to the *choices* that social actors make and the *capacities* or resources they derive from group membership (I would also add *cognitive resources* as they are likely to have some degree of independence from these socially derived resources). A child's success in the education system will depend on a combination of mechanisms: their decisions, their individual abilities and their socially derived resources. However, such mechanisms will only fire, i.e. lead to academic success, if the context is conducive. The context includes

the social rules, norms, values and relationships within which the child is located. For example, if a dominant norm among students is that no individual should stand out from the crowd, or alternatively, that the expression of superior ability must be constrained within narrow limits, then outstanding academic performance is unlikely to occur. The immediate conditions have to be conducive for an individual's resources and choices to be able to produce a particular outcome.

Pawson and Tilley have added a realist reconstruction of Durkheim's theory of egoistic suicide. As we have seen, Durkheim thought he was an *inductivist* while Homans and Merton have regarded his theory as being *deductivist*. Well, now we have a *retroductivist* rendition.

Durkheim (1951), whilst accepting that the decision to commit suicide was, of course, a matter of the individual's misery, desperation, isolation and so on, was able to show that such dispositions are socially structured and thus vary with the social cohesion and social support which different communities, localities, organizations, family groupings and so on are able to bring to marginalized members. He demonstrated that the supremely 'individual' act of suicide is in fact 'socially' structured and so produced the famous research cataloguing differences in suicide rates: higher in (individualistic) Protestant communities than in (collectivist) Catholic communities; higher for widowers in their competitive (public) male networks than widows in their communal (private) female networks; higher for the childless in their (restricted) family roles than for parents with their (extended) family ties; higher on (insouciant) weekends than (well-structured) weekdays; and so on. (Pawson and Tilley 1997: 65-6)

To put this another way, individual choices (e.g. to take one's life) are constrained or enabled by characteristics of the social context in which the individual is located. In this way, both agency and structure enter the explanation.

It is possible to confuse the testing of models in the *retroductive* strategy with the testing of theories in the *deductive* strategy. The latter tests for relationships between events, or variables, while the former tries to establish the existence of a particular generative mechanism. Explanation in the *deductive* strategy is achieved by means of a deductive argument made up of various kinds of propositions that postulate relationships between concepts. In contrast, explanation in the *retroductive* strategy is achieved by establishing the existence of the structure or mechanism that produces the observed regularity. Another important difference concerns the use of prediction. In the *deductive* strategy, scientific prediction is regarded as being possible by the use of deductive arguments, and can be part of the testing process. However, in the *retroductive* strategy, it is argued that prediction is impossible in the social sciences because of the open nature of social systems.

As *retroduction* and Realism are relatively new in the social sciences, the same intensity of criticism that has been levelled at *induction* and *deduction* has, perhaps, still to emerge. There has been a rearguard attack from a modified form of Positivism, called constructive empiricism (van Fraassen 1985), but this has been directed at all realist philosophies of science¹⁴ rather just the form of

¹⁴ A realist philosophy is one that is based on the assumption that reality exists independently of social actors and observers. Positivism, Critical Rationalism and the structural version of Realism all adopt this ontological assumption. However, they differ in their epistemologies, in how knowledge of this reality can be obtained, and how close it is possible to get to it.

Scientific Realism being discussed here. Another line of criticism has suggested that the notion of 'unobservable' cannot be applied to mechanisms in the social sciences in the same way as in the natural sciences. The structural branch of Realism in the social sciences deals with entities that are theoretical and therefore cannot be perceived by direct observation. It is only from their effects that they can be known. In the constructivist branch of Realism, the self-monitoring of social actors is not open to sensory experience but to communicative experience. See chapters 4 and 5 in Blaikie (1993a) for a critical review, and van Fraassen (1980), Benton (1981), Stockman (1983), and Churchland and Hooker (1985) for specific criticisms. (See Research Design 3 in chapter 8 for an application of one version of the *retroductive* strategy.)

Abductive Research Strategy

The idea of *abduction* refers to the process used to generate social scientific accounts from social actors' accounts; for deriving technical concepts and theories from lay concepts and interpretations of social life. The concept of *abduction* has had limited use in philosophy and social science. I know of only two writers who have used it. Peirce (1931a, 1931b, 1934a, 1934b) used *abduction* and *retroductive* synonymously to refer to the process of inventing a hypothesis to explain some observed phenomenon in somewhat the same way as *retroductive* is being used in this book. Following Peirce, Willer (1967) referred to *abduction* as the process used for generating theories. Peirce discussed three levels of abduction. The first involves guessing initial hypotheses after an examination of the data. The second level requires the use of mental experiments to simplify the hypotheses. At the third level, a model is abducted to provide a point of view, or rationale, as an organizing idea to integrate the hypotheses. My use of *abduction* includes some of these ideas but has a different emphasis because of its exclusive application within the Interpretive approach to social enquiry (see Blaikie (1993a) for further elaboration).

Unlike the other three research strategies, whose advocates claim are equally applicable to the natural and the social sciences, the *abductive* strategy is peculiar to the social sciences. It takes various forms and is associated with a range of Interpretive approaches to social enquiry.¹⁵ Because of its rejection of Positivism and Critical Rationalism, Interpretivism is often referred to as 'anti-naturalist' (meaning against the methods of the natural sciences) or 'anti-positivist' (meaning the rejection of Positivism and Critical Rationalism as discussed here). However, the constructivist version of Scientific Realism has some overlap with Interpretivism.

¹⁵ This approach has been labelled in many ways. During the paradigmatic debates in sociology in the 1960s and 1970s it was commonly called 'phenomenology', 'symbolic interactionism' or even 'ethno-methodology', although each of these has a different ancestry. It is now commonly called 'constructivism'. 'Interpretivism' is being used here to include all or a part of a number of traditions that share similar ontological assumptions. These include hermeneutics, phenomenology, symbolic interactionism, existential sociology and social constructivism. See Schwandt (1994) for a review of the varieties of interpretivism and constructivism.

Positivists are concerned with establishing the fundamental patterns or relationships in social life and Critical Rationalists are concerned with using such patterns to form explanatory arguments. However, Interpretivists argue that statistical patterns or correlations are not understandable on their own. It is necessary to find out what meanings (motives) people give to the actions that lead to such patterns. What leads people of one religion to have a higher chance of committing suicide than people of another religion? What leads young people from dysfunctional families to engage in criminal activities? According to Interpretivists, these relationships, between religion and suicide, or juvenile delinquency and broken homes, can only be understood once the connection between these concepts has been established in terms of motives of the people concerned.

Interpretivism takes what Positivism and Critical Rationalism ignore – the meanings and interpretations, the motives and intentions, that people use in their everyday lives and that direct their behaviour – and it elevates them to the central place in social theory and research. For Interpretivism, the social world *is* the world interpreted and experienced by its members, from the 'inside'. Hence, the task of the Interpretive social scientist is to discover and describe this 'insider' view, not to impose an 'outsider' view on it.

Interpretive social science seeks to discover why people do what they do by uncovering the largely tacit, mutual knowledge, the symbolic meanings, motives and rules, which provide the orientations for their actions. Mutual knowledge is background knowledge that is largely unarticulated; it is constantly being used and modified by social actors as they interact with each other; and it is produced and reproduced by them in the course of their lives together. It is the everyday beliefs and practices, mundane and taken for granted, which have to be grasped and articulated by the social researcher in order to provide an understanding of these actions.

Interpretivists have a very different view of social life to that held by Positivists and Critical Rationalists. Interpretivists are concerned with understanding the social world people have produced and which they reproduce through their continuing activities. This everyday reality consists of the meanings and interpretations given by the social actors to their actions, other people's actions, social situations, and natural and humanly created objects. In short, in order to negotiate their way around their world and make sense of it, social actors have to interpret their activities together, and it is these meanings, embedded in language, that constitute their social reality.

However, these subjective meanings are not private; they are *intersubjective*. Members of a particular group or society share common meanings and interpretations, and they maintain them through their ongoing interaction together. Therefore, social explanations need to go beyond the specific meanings that a social actor gives to his/her actions and needs to deal with typical meanings produced by typical social actors. This involves the use of approximations and abstractions.

Hence, the *abductive* research strategy entails *ontological* assumptions that view social reality as the social construction of social actors. It is their creation and does not exist independently of their social activities together. Social reality is regarded as the product of processes by which social actors together negotiate the meanings

for actions and situations; it is a complex of socially constructed mutual knowledge – meanings, cultural symbols and social institutions. These meanings and interpretations both facilitate and structure social relationships. Social reality is the symbolic world of meanings and interpretations. It is not some ‘thing’ that may be interpreted in different ways; it is those interpretations. Hence, in contrast to physical reality, which has to be interpreted by scientists, social reality is pre-interpreted; it has already been interpreted before social scientists begin their task of interpretation.

These *ontological* assumptions can be regarded as ‘relativist’ rather than ‘absolutist’; the idea that there is single social reality is rejected in favour of the idea that there may be multiple and changing social realities. The implication is that there is no independent or neutral way of establishing the ‘truth’ of any of them; each social reality may be ‘real’ to its inhabitants.

The *epistemological* assumptions of the *abductive* research strategy regard social scientific knowledge as being derived from everyday concepts and meanings, from socially constructed mutual knowledge. The social researcher enters the everyday social world in order to grasp these socially constructed meanings. At one level, the accounts of a social world produced by the social scientist are redescriptions in social scientific language of the social actors’ everyday accounts. At another level, these redescriptions can be developed into theories that go beyond everyday knowledge to include conditions of which social actors may be unaware.

The distinguishing features of the *abductive* research strategy are:

- its view of the nature of social reality;
- the origin of answers to ‘why’ questions; and
- the manner in which those answers are obtained.

It is based on the following principles.

- 1 The basic access to any social world is the accounts that people can give of their own actions and the actions of others.
- 2 These accounts are provided to the social scientist in the language of the participants and contain the concepts that the participants use to structure their world, the meanings of these concepts, and the ‘theories’ that they use to account for what goes on.
- 3 However, much of the activity of social life is routine and is conducted in a taken-for-granted, unreflective manner.
- 4 It is only when enquiries are made about their behaviour by others (such as social scientists) or when social life is disrupted, and/or ceases to be predictable, that social actors are forced to consciously search for or construct meanings and interpretations.
- 5 Therefore, the social scientist may have to resort to procedures that encourage this reflection in order to discover the meanings and theories.
- 6 Ultimately, it is necessary to piece together the fragments of meaning that are available from their externalized products.

It is to the process of moving from lay descriptions of social life to technical descriptions of that social life that the notion of *abduction* is applied. In other words, the *abductive* strategy involves constructing theory that is grounded in everyday activities, and/or in the language and meanings of social actors. It has two stages:

- describing these activities and meanings; and
- deriving categories and concepts that can form the basis of an understanding or an explanation of the problem at hand.

The logic of *abduction* that is elaborated here draws primarily on the work of Schütz (1963a, 1963b), but also shares much in common with the work of Winch (1958), Douglas (1971), Rex (1971, 1974), and, particularly, Giddens (1976). (See Blaikie 1993a: 176–93 for a review of these writers.)

Schütz claimed that all scientific knowledge of the social world is indirect. The social sciences cannot understand people as living individuals, each with a unique consciousness. Rather, they can only be understood as personal ideal types existing in an impersonal and anonymous time which no one has actually experienced or can experience.

Schütz insisted that social scientists’ ideal types (second-order constructs) must be derived from everyday typifications (first-order constructs) which constitute social actors’ social reality.

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 common-sense thinking of men [*sic*], 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 of the constructs made by the actors on the social scene, whose behaviour the social scientist has to observe and to explain. (Schütz 1963a: 242)

The critical difference between first- and second-order constructs is that they are constructed with different purposes in mind and within different contexts. First-order constructs take a particular social stock of everyday knowledge for granted and are designed to deal with a social problem – to make social interaction possible and understandable to the participants. Second-order constructs are designed to deal with a social scientific problem – to explain social phenomena – and have to relate to a social scientific stock of knowledge (Schütz 1963b: 337–9).

The move from first-order to second-order constructs requires the social scientist to select from the activities and meanings of everyday life those considered to be relevant to the purpose at hand, and to construct models of the social world – typical social actors with typical motives and typical courses of action in typical situations.

Yet these models of actors are not human beings living within their biographical situation in the social world of everyday life. Strictly speaking, they do not have any biography or any history, and the situation into which they are placed is not a situation defined by them but defined by their creator, the social scientist. He [*sic*] has created these puppets or homunculi to manipulate them for his purpose. A

merely specious consciousness is imputed to them by the scientist, which is constructed in such a way that its presupposed stock of knowledge at hand (including the ascribed set of invariant motives) would make actions originating from it subjectively understandable, provided that these actions were performed by real actors within the social world. (Schütz 1963b: 339–40)

While Schütz did not set out the *abductive* strategy as a set of principles or steps, it is possible to extract this from his work.

- 1 The social scientist 'observes certain facts and events within social reality which refer to human action' (1963a: 247).
- 2 'He [*sic*] constructs typical behaviour or course-of-action patterns from what he has observed' (1963a: 247; 1963b: 339).
- 3 'He co-ordinates to these typical course-of-action patterns a personal type, a model of an actor whom he imagines as being gifted with consciousness' (1963a: 247; 1963b: 339).
- 4 'He thus ascribes to this fictitious consciousness a set of typical notions, purposes, goals (in-order-to motives corresponding to the goals of the observed course-of-action patterns and typical because-motives upon which the in-order-to motives are founded), which are assumed to be invariant in the mind of the imaginary actor-model' (1963a: 247; 1963b: 340).
- 5 This puppet 'is invested with a system of relevances originating in the scientific problem of his constructor and not in the particular biographically determined situation of an actor within the world' (1963b: 341).
- 6 The puppet 'is interrelated in interaction patterns to other... puppets constructed in a similar way' (1963a: 247).
- 7 This constitutes a model of the social world of everyday life (1963a: 247).
- 8 The system of typical constructs designed by the social scientist must be formed in accordance with the following postulates:
 - (a) the postulate of *logical consistency* – they must supersede first-level constructs by conforming to the principles of formal logic and by being clear and distinct (1963b: 342);
 - (b) the postulate of *subjective interpretation* – it must be possible to refer 'all kinds of human action or their result to the subjective meaning such action or result of an action had for the actor' (1963b: 343); and
 - (c) the postulate of *adequacy* – 'A human act performed within the life-world by an individual actor in the way indicated by the typical construct would be understandable for the actor himself as well as for his fellow-men [*sic*] in terms of commonsense interpretations of everyday life' (1963b: 343; 1963a: 247).
- 9 In much the same way as social actors test first-level constructs, ideal types can be verified by predicting 'how a puppet or system of puppets might behave under certain conditions' (1963a: 248). In this way propositions can be developed which state relations between sets of variables.

What Schütz, Winch (1958), Douglas (1971), Rex (1971, 1974) and Giddens (1976, 1984) have in common is their belief that social science accounts of the

social world must be derived, at least initially, from the accounts that social actors can give of the aspect of their world of interest to the social scientist. They differ, however, in what is done with these accounts. There is one tradition that argues that reporting everyday accounts is all that is possible or necessary in order to understand social life (see e.g. Garfinkel's ethnomethodology). Others are prepared to turn these accounts into social scientific descriptions of the way of life of a particular social group (community or society), but they would insist on keeping these descriptions tied closely to the social actors' language. Such descriptions lend themselves to two other possibilities. The first is to bring some existing theory or perspective to bear on them, thus providing a social scientific interpretation or critique of that way of life. The second is to generate some kind of explanation, using as ingredients the ideal types that are derived from everyday accounts. There are disagreements on both of these latter possibilities, in the first case about whether criticism of another way of life is legitimate, and, in the second case, about what else can or should be added to the everyday account to form a theory. (A practical application of the *abductive* strategy can be found in chapter 8, Research Design 4.)

Ontological and Epistemological Comparisons

While the four research strategies are based on unique combinations of ontological and epistemological assumptions, there are some overlaps. For example, the *inductive* and *deductive* strategies both adopt 'realist' ontologies. They assume that social phenomena exist independently of both the observer and social actors; it is the regularities or patterns in this reality that social research endeavours to discover and describe, and it is elements of this reality that determine social behaviour. However, while these two strategies may share a common ontology, they differ in their epistemologies, in their assumptions about how this reality can be described, and, particularly, how it can be explained. In the *inductive* strategy, the activity of observing, and the possibility of establishing the truth of a theory, are accepted uncritically, whereas in the *deductive* strategy, the inherent limitations of observations and the impossibility of knowing whether a theory is true are recognized. In the *inductive* strategy, faith is placed in 'objective' procedures to arrive at the truth, while the *deductive* strategy involves the use of rigorous and critical evaluation of any theory that is proposed. The logics of their procedures are fundamentally different, as are their products. The *inductive* strategy produces descriptions of regularities that form a hierarchy of generality; lower-level 'conjunctions' or correlations are explained as being specific cases of higher-level regularities. The *deductive* strategy, on the other hand, involves a search for causal explanation based on deductive arguments, the conclusions of which are rigorously tested.

Because the *retroductive* strategy is based on the idea that reality consists of three domains, it is possible to adopt different ontological assumptions in each domain, particularly the 'empirical' and the 'real' domains. In the structuralist version, the empirical domain can be regarded as being an 'external' reality, while in the constructivist version, reality is socially constructed. Both forms of reality

are observable. In the structuralist version, the structures and mechanisms that produce regularities reside in the real domain. These structures can have an influence on social actors and are regarded as part of reality that is 'external' to them. In the constructivist version, the explanatory mechanisms are cognitive rather than social structural in nature. In both versions of the *retroductive* strategy, the epistemological assumptions of the *inductive* strategy are rejected. However, the *retroductive* strategy is faced with the same dilemma as the *deductive* strategy, i.e. how to make contact with the hypothesized structures and mechanisms of the real domain.

The *abductive* research strategy entails radically different ontological assumptions from those of the *inductive* and *deductive* strategies. The *abductive* strategy is not only based on a constructivist view of social reality, but the source of its explanatory accounts is also located there. The epistemological assumptions of *abductive* strategy distinguish it sharply from *inductive* and *deductive* strategies, and the structuralist version of the *retroductive* strategy. However, it shares a great deal in common with the constructivist version; it is only in the location of the explanatory accounts that differences are evident and, even then, they are somewhat illusory. For example, Harré's use of models and Weber's notions of ideal types are very similar (see Blaikie 1994).

In spite of the differences in ontological and epistemological assumptions between the research strategies, there is a methodological problem that confronts the users of all four. This concerns the relationship between data and social reality. Data are produced by the activities of social researchers acting on some version of social reality. In the *inductive* and *deductive* research strategies, concepts are used to make contact with social reality. 'Measuring' these concepts is a major way of producing data. Concepts are also used in the *retroductive* research strategy to initially describe social reality, and postulated structures or mechanisms provide the path to 'unknown' parts of it. Data about structures or mechanisms are produced by 'observation' and experiment. In the *abductive* strategy, social reality is socially constructed and is seen to reside in lay language. Knowledge of this reality is produced by 'immersion' in it.

A problem encountered in using any of the research strategies is that social researchers can only collect data from some point of view, by making 'observations' through spectacles with lenses that are shaped and coloured by the researcher's language, culture, discipline-based knowledge, past experiences (professional and lay), and the expectations that follow from these. It is possible to introduce some controls on these factors, such as having multiple investigators, but, ultimately, all 'observation' is interpretation – all observation is theory-dependent. Therefore, there will always be a gap of some kind between the data that are collected and the reality that they are supposed to represent.

However, in the case of the *abductive* research strategy, and the constructivist version of the *retroductive* strategy, the situation is somewhat different. The reason is that the ontological and epistemological assumptions are very different. In these two cases, social reality has no independent existence apart from the 'knowledge' of it held by the social actors who produce and reproduce it. If the social researcher can learn to inhabit their social reality as a 'native', then they will be as close as any person can be to that social reality. To the extent that a

researcher chooses to maintain some distance from such social realities, or cannot avoid doing so, a gap will be created between the social reality and any understanding of it. Similarly, if in the process of redescribing the social actors' accounts of their activities in social scientific language the researcher fails to 'retain the integrity of the phenomenon', for example by introducing concepts and ideas that are foreign to that social reality, a bigger gap will be created. In this case, a 'distorted' view of a social reality will be produced. Hence, it is inevitable that distance will also be present when the *abductive* research strategy is used, although its nature and degree will usually be different from that in the other strategies.

In short, social researchers are constantly plagued with the problem of creating 'sociological' realities that may not represent the 'social' realities they claim to be studying, whatever those realities are assumed to be. The choice of research strategy, and how it is used, has a large bearing on this problem.

Research Strategies and Research Questions

As we have seen, the four research strategies provide different ways of answering 'why' questions; each one sets out a logic of enquiry for generating an account of some phenomenon; a starting-point, a series of stages and a concluding-point. It has been argued that the *inductive* strategy is weak on answering 'why' questions, and it is recognized that only some versions of the *abductive* strategy are used for it. The *inductive* strategy explains by means of well-confirmed generalizations that can be expected to hold across space and time. The *deductive* strategy explains by means of well-tested theories that represent the current state of knowledge. The *retroductive* strategy explains by means of real mechanisms, the existence of which has been established. Lastly, the *abductive* strategy produces understanding based on 'thick' descriptions and ideal types that have been derived from everyday accounts.

The *inductive* and *abductive* research strategies are the only ones that can answer 'what' research questions, but they do so in quite different ways. If a 'realist' rather than a 'relativist' ontology is desired, then the alternative is the *inductive* strategy. However, it is necessary to accept the assumptions of the *inductive* strategy, and the methods for overcoming its limitations.

The pragmatic solution to the limitations of the *inductive* research strategy is well known and is commonly referred to as 'operationalism'. It has its foundations in Durkheim's injunction to define concepts in advance of the research being undertaken. Operationalism traditionally requires two levels of definition: a formal definition that states what the concept means; and an operational definition that states how the concept will be measured. For example, the concept of 'social status' might be formally defined as 'a position within a social hierarchy', and then measured in terms of occupational prestige. This will be discussed further in chapter 5.

Operationalism infringes the strict requirements of the *inductive* strategy because it involves both focusing attention on specific phenomena and limiting the conception of them. To the purists, this is introducing preconceptions. The

process of formally defining any concept, in a way that will relate it to the current state of knowledge, involves locating it in a network of concepts and their accepted definitions. This introduces a background of theoretical assumptions as all concepts carry theoretical baggage.¹⁶ Therefore, all description involves some point of view, and pure description is impossible.

Both the *deductive* and *retroductive* research strategies accept these restrictions. Therefore, they have no difficulty in using answers to 'what' questions derived in this way as topics for which answers to 'why' questions are sought. The same is also the case for many *abductivists*; while being suspicious of the ontological assumptions on which such answers to 'what' questions are based, they may be prepared to use these descriptions as a starting-point for research.

Answering a 'how' question requires a different kind of description which is built on previous answers to both 'what' and 'why' questions. Answers to 'how' questions require a description of a desired state of affairs, and the specification of stages and procedures for getting from an existing situation to the desired situation. Clearly, this type of description is complex and requires a great deal of knowledge of the social phenomenon and the context. All four strategies would claim to be able to answer 'how' questions, although there are disagreements about which ones are the most effective. In some cases, a combination of strategies might be an advantage.

Choosing a Research Strategy

The principal aim in choosing a research strategy, or strategies, is to achieve the best procedure(s) for dealing with a research topic, and, particularly, for answering research questions. However, it is important to note that it may be necessary to use different strategies for different research questions. For example, the *inductive* strategy can be used to answer 'what' questions, and the *deductive* and *retroductive* strategies are used to answer 'why' questions. The *abductive* strategy has the advantage that it can be used to answer both 'what' and 'why' questions, depending on the branch of Interpretivism within which the researcher works.

To arrive at a decision on what will be the best research strategy or strategies, the capabilities and the relative strengths and weakness of each strategy must be understood. This requires a reasonably sophisticated understanding of the philosophies of social science and the approaches to social enquiry with which each research strategy is associated (see Blaikie 1993a, particularly chapter 7).

Research questions can usually be answered by using more than one research strategy. For example, in the research topic 'Absenteeism in the Public Sector' (see the Appendix), the research question – 'Why does absenteeism occur?' – could be answered by selecting an appropriate theory and putting it to the test in this context (the *deductive* strategy), or, alternatively, by trying to understand work and life from the nurses' points of view (the *abductive* strategy).

The two strategies are likely to produce different kinds of accounts of absenteeism, and it will be difficult, if not impossible, to decide which is the best one. One criterion might be to see which account leads to interventions that produce the greatest reduction in absenteeism. However, situations like this are always complex and changing, interventions are never simple, and outcomes may not be easy to establish conclusively. It has been argued that there are no completely neutral criteria for making such choices (see e.g. Kuhn 1970). Hence, ultimately, the choice of research strategy has to be a matter of judgement, and judgements involve both acceptable criteria and personal preferences.

A number of other factors can influence the choice of research strategy. When a researcher is contributing to a particular research programme, a decision might be made to select the strategy or strategies already in use. This may be a conscious choice or may simply be taken for granted, particularly if the researcher is trained in the research traditions used in that research programme, and in the particular paradigm within which it is located. Not to follow these traditions may lead to conflict with colleagues and, ultimately, to reduced career prospects.

It is also possible that a preference for, or familiarity with, certain research methods will influence the choice of strategy. For example, if a researcher believes that particular quantitative methods are best, and has received training in only these methods, they may opt for a strategy in which it is believed these methods are used. For example, the *deductive* strategy might be selected because it is believed that quantitative methods, such as questionnaires, are used in this strategy. Similarly, students who have received training in the use of a new computer package for analysing textual data may assume that it must be used within the *abductive* strategy.¹⁷

Another set of possible influences has to do with the audiences that a researcher considers important and the assumptions that are made about their methodological preferences. These audiences can include funding agencies, publishers and journal editors, discipline colleagues and consumers of the research, such as book buyers, journal readers, clients and respondents. In the case of research students, there is the very important group that includes supervisors/advisers and examiners. Perceptions of the preferences of these audiences may need to be taken into account. However, conflict between audience expectations can obviously be a problem.

In the last analysis, practical considerations, such as time, cost and availability of equipment, may have an influence. While these factors are more directly associated with research methods, views about links between strategies and methods, whether correct or not, may lead to the rejection of a particular strategy. For example, in-depth interviewing may be seen to be associated with the *abductive* research strategy, and as this method can be time-consuming, both the method and the strategy may be rejected.

The possible influence of all these factors, and the difficulty involved in establishing the relative merits of the four research strategies, would seem to undermine my case for a detailed knowledge of the strategies and the need to give careful

¹⁶ These problems are related to what is known as the 'theory dependence of observations' (Hanson 1958). If there is no theory-neutral observation language, then pure inductivism is impossible.

¹⁷ I have heard it said that some postgraduate students have even chosen their research topic, as well as their research strategy, so that they could use such software.

consideration to their selection. My concern is about making informed choices based on adequate knowledge of what is being selected and rejected and on an understanding of the ontological and epistemological assumptions that go with such choices. The fact that personal, social and practical factors may also have an influence makes it necessary not only to be aware of these, but also of the consequences of allowing them to influence the choices.

Research Design and Research Strategies

The selection of a research strategy does not predetermine the kind of research design that is adopted. While some research strategies tend to be associated with particular types of research, such as the *inductive* strategy and social surveys, the *deductive* strategy and the experimental method, and the *abductive* strategy and case studies, there is no necessary connection. The logic of any of the four research strategies can be implemented using a variety of research designs.

Differences exist between the research strategies in the kinds of objectives they are able to pursue (see table 4.2). *Exploration* and *description* are confined to the *inductive* and *abductive* strategies. While the *deductive* and *retroductive* strategies need description as their starting-point, they must rely on the other two strategies for them. The major task of the *deductive* and *retroductive* strategies is *explanation*, although *inductivists* also claim to be able to do it, and some *abductivists* would like to be able to do it. *Prediction* is confined to the *inductive* and *deductive* strategies, again being achieved in different ways. Some *abductivists* may be interested in *prediction*, based on 'thick' descriptions, but this is of minor concern. The objective of *understanding* is the exclusive preserve of the *abductive* strategy. Some users of the *retroductive* and *abductive* strategies are interested in *change*,

Table 4.2 Research strategies, objectives and questions

Objective	Research strategy				Type of research question
	Inductive	Deductive	Retroductive	Abductive	
Exploration	***			***	What
Description	***			***	What
Explanation	*	***	***		Why
Prediction	**	***			What
Understanding				***	Why
Change		*	**	**	How
Evaluation	**	**	**	**	What and Why
Assess impacts	**	**	**	**	What and Why

Key: *** = major activity; ** = moderate activity; * = minor activity. These 'weightings' of the connections between objectives and research strategies are indicative only.

particularly researchers concerned with emancipation. *Evaluation* research is practised by followers of all four research strategies, with a common division between positivist and constructivist approaches (Guba and Lincoln 1989) and quantitative and qualitative methods. Social impact assessment can use the *inductive* strategy, perhaps in combination with the *deductive* strategy, the *retroductive* strategy or the *abductive* strategy.

As we shall see in chapter 7, while there may be conventions about quantitative methods being used in some strategies, for example the *inductive* and *deductive*, and qualitative methods being used in others, for example the *abductive*, there is no necessary association. Methods can be used in the service of a number of research strategies. However, they will need to be used, and can be used, with different ontological assumptions. For example, observation can be used in the service of all four research strategies, although just how it is used might vary; the same is true in the case of interviewing. The critical issue is the need to be aware of the ontological and epistemological assumptions within which the method is used.

Research Strategies and the Role of the Researcher

To conclude this discussion of the four research strategies, we need to return to an issue raised in chapter 2 regarding the role of the researcher. Because of its particular ontological and epistemological assumptions, each research strategy entails a position with regard to objectivity and validity and, hence, affects the choice of role.

In the *inductive* research strategy, it is argued that the researcher must take a *detached observer* position and avoid allowing personal values or political commitments to contaminate the research. If objectivity cannot be achieved, then the generalizations produced cannot be trusted as representing the regularities in social life; it would not be possible to achieve the aim of arriving at true statements about the world.

While the aim of the *deductive* research strategy is also a search for the truth, it is recognized that the culture, including language, together with knowledge and previous experiences, make presuppositionless data collection impossible. However, even though 'observation' may be theory-laden, it is still necessary to endeavour to exclude personal values and political commitments from the research process. Detachment remains the ideal, even though it is recognized that its complete achievement is impossible.

The two branches of the *retroductive* research strategy, the 'structuralist' and the 'constructionist', deal with this issue differently. The 'structuralist' version essentially follows the role of the researcher adopted in the *deductive* strategy. The aim is to establish the existence of real structures and mechanisms even in the face of the 'theory-dependence of observation' (see Pawson 1989). In the 'constructionist' version, the view of the role of the researcher is likely to be one of those adopted in the *abductive* strategy.

It is in the *abductive* research strategy that very different views of the role of the researcher are adopted. These include the *faithful reporter*, the *mediator of languages*, the *reflective partner*, the *conscientizer*, and the postmodern 'narrative dialogue'. The reflexive nature of this type of social research casts the researcher in very different roles to that required by both the *inductive* and *deductive* research strategies (see chapter 2, 'Roles for Researchers').

In spite of their sympathy for one or more of these latter roles, some writers have expressed reservations about their implications for the social scientific enterprise (e.g. Geertz 1988; Hammersley and Atkinson 1995). The acceptance of these roles can lead the researcher in a number of directions, including the abandonment of any concern with the production of new social scientific knowledge. The fear is that research will just become a form of journalism or part of a political programme, or will lead to 'methodological paralysis'. While I sympathize with the view that social science should include emancipatory concerns, I am also committed to seeking better understanding of social life, preferably by incorporating the social actors' point of view. In any case, without sound understanding, emancipation becomes problematic. Of course, it is necessary to accept the idea that such knowledge will be limited in its relevance in terms of both time and space. However, accepting this degree of relativity in the nature of the knowledge we produce does not invalidate the social research enterprise. An example of the adoption of a middle position can be found in Hammersley and Atkinson (1995: 1–22).

Conclusion

When social researchers set out to answer their research questions, they are faced with the task of choosing the best research strategy or strategies to answer them. Four fundamentally different strategies are available, each with its particular combination of ontological and epistemological assumptions, and its unique logic of enquiry.

The research strategies differ in the types of research objectives and research questions they can answer. The *inductive* and *abductive* strategies are the only ones that are useful for *exploration* and *description*, although they each achieve these objectives in different ways and with different outcomes. The *deductive* and *retroductive* research strategies are the most suitable for pursuing the objective of *explanation*. Likewise, they achieve this using different procedures based on different assumptions. The *abductive* research strategy is the only one that can pursue the objective of *understanding* because of its particular ontological and epistemological assumption, and its peculiar logic of enquiry. The four research strategies have different capacities with regard to the other research objectives and types of research questions.

While the considerations in the previous paragraph are very important in the choice of research strategy, other factors can have an influence. Although not always recognized, chief among them is the researcher's preference for certain ontological and epistemological assumptions. However, there is also a range of pragmatic and (small 'p') political factors that can play an important role.

Before proceeding to a consideration of the research methods that may be suitable for selecting, collecting and analysing data to answer research questions, within a particular research strategy, we need to backtrack to consider a set of fundamental issues. These are the roles of concepts, theories, hypotheses and models in social research.