Making Progress in Housing

A Framework for Collaborative Research

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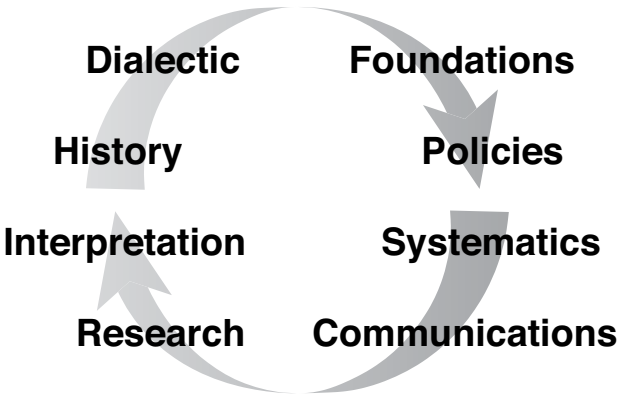

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3 Towards a scientific approach to research

> Dynamically a science is the interplay of two factors: there are data revealed by experience, observation, experiment, measurement; and on the other hand, there is the constructive activity of mind. By themselves the data are objective, but they are also disparate, without significance, without correlation, without coherence. Of itself, the mind is coherence; spontaneously it constructs correlations and attributes significance; but it must have materials to construct and correlate; and if its work is not to be fanciful, its materials must be the data. Thus thought and experience are two complementary functions; thought constructs what experience reveals; and science is an exact equilibrium of the two.
>
> Bernard Lonergan in *For a New Political Economy* ([1942–1944] 1998: 5)

I am proposing that Functional Collaboration is a scientific approach through which we can make progress in housing. But what is a scientific approach to any subject? What distinguishes a scientific approach from any other approach? Can we have a scientific approach to social science? What is the status of scientific knowledge? These and many more fundamental questions about science have long been debated.[1]

At the beginning of his book, *The Beginnings of Western Science*, David Lindberg (1992) reviewed the many different meanings of the term 'science'. Different traditions describe it in different ways. For example, positivists highlight the empirical aspects; constructivists such as Schutz (1982) and Berger and Luckmann (1971) highlight the role of social agents in constructing the world; critical realists such as Danermark et al. (2002) and Sayer (2010) highlight the objective existence of reality in terms of observation and theorising; Kuhn (1970) and his successors highlight the historical and revolutionary aspects of science; others highlight its logical processes of induction and deduction (Mill [1882] 2009).

Many traditions reserve the term 'science' for the natural sciences rather than the social or human sciences. Some reserve the term to understanding the world rather than applying that understanding. Flyvbjerg (2001), on the other hand, dismisses the traditional understanding of science as 'epistemic science', arguing that social science cannot do what the natural sciences do. In his view, the key

characteristic of the natural sciences is its capacity to predict. As social science cannot predict, it should abandon its goal of being an epistemic science. He proposes that social science should be a phronetic science. This is where social science is strongest. Phronetic social science deliberates about social actions, in particular, values and power. It operates in a context where variables are dependent upon the context. Flyvbjerg seeks to 'restore social science to its classical position as a practical, intellectual activity aimed at clarifying the problems, risks and possibilities' (2001: 4).

The common aim of all disciplines, regardless of their philosophic tradition, 'is to advance knowledge in their field, to provide new or better understanding of certain phenomena, to solve intellectual puzzles and/or to solve practical problems' (Blaikie 2003: 10–11). For the most part, disagreements about what is and what is not science revolve around differing descriptions of science. To my mind, these descriptions do not reach what is constitutive of science, what is most central, significant and relevant to an understanding of science. These descriptions focus on the characteristics of the methods and results of a discipline: whether the data collection is sound; whether its methods produce accurate, rigorous and precise results; whether the discipline can predict what will happen. Indeed, the importance of a scientific approach to housing research does lie in the results it produces. These results bear fruit not only in greater understanding of housing but also in the implementation of better housing practices. Science contributes not just to the advancement of knowledge but also to the advancement of better living. If science is to contribute to better living, this advancement of knowledge must extend to a better understanding of what is required to implement this living. However, getting results presupposes a method, a way of going about getting results. Method is 'a set of directives that serve to guide a process towards a result' (Lonergan [1957] 1992: 421). Further, method presupposes a question. It guides the process that takes us from a question to an answer (the result). Different methods answer different questions and, as we know, different methods produce different results.

So, the question arises, by what method do we find an answer to the question 'what is science?' or the question 'what is a scientific approach to housing?' As yet I'm not yet prepared to answer this question, for, as we will see in Chapter 5, asking and answering such questions are not as straight-forward as they appear. It is only in Chapter 9 that an *explanatory definition* of science will emerge. Here I want to lay some initial groundwork for later discussions by reflecting upon the questions we ask and the type of answer each question anticipates. After all, asking and answering questions is central to science and a scientific approach to housing. I outline a proposal for a scientific approach to housing research. I begin by outlining in very general terms a current standard model of housing research.

A current standard model of housing research: external and internal processes

Method is the process whereby we bring about some result. This result can be envisaged as some endpoint or as some interim point on the way towards that

endpoint. So it is within housing research that an investigation consists of a series of steps, each of which reaches some interim result which contributes, in some way, to some endpoint result. Such a series of steps may include:

1 Defining the problem more clearly, which involves setting out a series of research questions whose answers are interim points to solving the problem.
2 Reading the research relevant to that problem in order to, among other things, (i) find out the experiences of others and their reflections on and understanding of the problem and (ii) work out ways in which the series of research questions could be answered. This too involves a series of steps, each of which produces some interim result such as searching out and determining the relevant research, prioritising what research will be read and to what extent, reading each book/article, assembling the results of each book/article, determining gaps in the research etc.
3 Undertaking some field research. This may include some combination of undertaking a survey, interviewing participants and observation. It also involves a series of steps, each of which produces some interim result such as drafting a set of questions, piloting these questions, engaging participants, distributing the survey or undertaking interviews or making observations, developing a framework of analysis, analysing the results and reaching some conclusions.
4 Writing up these conclusions. Again this involves a series of steps, each of which produces some interim result such as structuring the report into chapters, sections, paragraphs and sentences.

In describing this series of steps (and a series within each step), I am seeking here to outline a standard social science research model that is commonly, but by no means universally used in housing research. While quantitative and qualitative methods differ in their pre-suppositions, the type of data collected, whether hypotheses are proposed, the type of hypotheses proposed and the type of conclusions drawn, they both go through this series of steps. This standard model is common across different epistemological and ontological approaches whether positivist, interpretivist, critical realist etc. even though they strongly disagree about the starting point for housing research. It is a common across academic disciplines. It is common across research undertaken for different purposes whether theoretical, policy analysis, strategic planning etc.[2]

As described here, this standard model involves a series of external activities. Whether it is an adequate description, whether it adequately covers different approaches, disciplines and purposes may be a matter of some debate. Here, however, I want to draw attention to something beyond these external activities: for each external activity there is a parallel internal activity, whether experiencing, imagining, thinking, considering, supposing, formulating, defining, judging, questioning, criticising, evaluating, deciding. So, the doodling, drawing, sketching, writing etc. that is involved in defining a problem, or the reading and note-taking involved in reading others' research, or the analysis of field research, has a parallel

set of internal activities that guide the external activities within each step, such that each step is achieved and contributes to reaching some endpoint of the overall research project.

Further, as the housing researcher proceeds through the external activities, the internal activities may change the researcher such that they understand and define the problem in a new way. As they do so, they change the external activities – they read other research; they do other field research, they interview different people, they interrogate different datasets; they reach different conclusions. These internal activities are not just elements of the rational processes of logic. They are also elements in the processes of understanding, of learning, of discovery, of creativity and of innovation, processes that shift from one frame of reference to another. At times these processes achieve results slowly and incrementally. At other times they can achieve them rapidly in leaps and bounds. Transformations in understanding can occur at any time as the researcher proceeds through the series of external activities. These transformations require the researcher not just to change the external activities but to begin again on a different basis. So it is through some combination of these internal and external activities that we make progress in understanding a problem (and its solution).

At times these internal activities, however, are not observable. Yet as housing researchers we are more or less conscious of them. Indeed, with practice we can become more conscious of them. Nevertheless, many housing researchers are so focused on a housing problem and coming up with an immediate practical solution to this problem that they are largely unaware of the internal processes of research, do not take account of them or set them aside. For these researchers the significance of the data and the solution(s) they propose are largely unproblematic. Their results are continuous with the work of practitioners seeking solutions to everyday problems. This common-sense approach to housing research operates within the taken-for-granted presuppositions of a culture and seeks to solve the immediate problems of practitioners.

More fundamentally, however, housing researchers operating within this common-sense approach to housing presuppose the adequacy of their internal processes. Yet, the same internal processes that lead a researcher to ask about the significance of data and possible solutions to everyday problems can also turn inward and raise questions about these internal processes: what precisely is being investigated? are the answers to my questions adequate? by what criteria do I judge that I have reached an adequate answer? to what extent is my perspective limited by involvement and interests? etc.

It is through a phenomenology of research that we can come to some understanding of our internal activities, some self-understanding of what we are doing when doing research. To do so may require us to go beyond the limitations of traditional phenomenology, viz. that it has not sufficiently explored rationality. 'Phenomenology is concerned with what is evident. The thematic treatment of what is evident is considered secondary, merely the phenomenologist's report. But there has not been done a phenomenology of rational consciousness, of the process of asking, Is it so? ...' (Lonergan [1957] 2001a: 275).

Kemeny urges housing researchers to take conscious control of the research agenda and 'acknowledge, and take a stand on, the inevitability of their involvement in the social construction of housing issues' (1992: 32). Here, I am suggesting that we also take conscious control of the processes of research. If we want to improve our chances of developing good research, then it will help to understand what goes on when we are researching. Once we understand what goes on, then we can take some deliberate control over how we proceed and over the varied but related activities that constitute research (to paraphrase Shute and Zanardi 2006: 31).

Most housing research is locked into a taken-for-granted everyday common-sense approach to housing research. To shift out this approach, a housing researcher must advert to their internal processes and ask a key question: what am I doing? This is not an easy question to answer.

In *Housing and Social Theory* and elsewhere, Kemeny has called for a shift to theory in housing studies. What such a shift might mean depends upon an answer to the question: what is theory? It is this question that Peter King (2009: 51) asks at the conclusion of his article on 'Using Theory or Making Theory': 'Perhaps this paper should be taken as a challenge to established approaches to housing and social theory: as a questioning of what we mean by theory; what its possibilities and limits are; and, in consequence, what we take housing to be.'

In Chapter 7 this question about theory becomes: what am I doing when I am theorising? Answering such a question, however, is not enough. A shift to theory in housing studies depends upon a decision of the housing researcher to act in accordance with that answer. It is this decision that shifts a researcher into the world of theory. I would understand this shift as more of a 'displacement' into a new world rather than a shift that is continuous with the everyday taken-for-granted world of common-sense living.

A decision to shift into the world of theory, however, presupposes an answer to another question, one which evaluates whether it is worthwhile doing so. To advert to this presupposition raises the question: what am I doing when I am evaluating?

These 'what am I doing?' questions presage a shift into another world: the world of the subject as subject. I will discuss 'the subject as subject' more fully in Chapter 7 and propose not just a single displacement into the world of theory but rather a double displacement: a displacement into the world of theory and a more radical displacement into the world of the subject as subject.

Here, however, I want to highlight the gap between the current culture of housing research and what I will propose in Part II. This gap presents a difficulty in communicating a new understanding (and doing) of science.

> For complete self-development is a long and difficult process. During that process one has to live and make decisions in the light of one's undeveloped intelligence and under the guidance of one's incomplete willingness. And the less developed one is, the less one appreciates the need of development and the less one is willing to take time out for one's intellectual and moral education.
>
> (Lonergan ([1957] 1992: 650)

For a housing researcher the fundamental challenge is to reach some self-understanding of what they are doing when doing research. It involves a long, difficult and personal journey of understanding oneself, of understanding their practices and their methods, of understanding what they are doing when they are investigating, theorising, evaluating or deciding to implement something new.

Any new scientific discovery whether in quantum physics, chemistry, biology or the social sciences is the result of a personal journey of discovery. By striking out on new paths individuals have brought about revolutions in science and innovation in everyday living. Here the personal journey of discovery is a journey within. It is just as difficult as any other scientific journey, if not more. It is just as difficult to communicate.

> Just as the non-physicist can identify and distinguish the colours of the rainbow, so the philosopher may identify and distinguish types of understanding. But such identification by the philosopher is no more the generalized empirical method that is generative of scientific metaphysics than descriptive identification of types of flowers is scientific botany…
>
> This notion of a generalized empirical method, a self-attentive pursuit which has the dimensions of a science, may be unpalatable to some, incredible to others. But on its operative admission stands or falls the project of ongoing collaboration. One may find…the projected self-attention obscure. If so, one must begin from precisely that discovery: 'He can contrast that experience of not understanding with other experiences in which he felt he understood. Then he can turn his efforts to understanding his experiences of understanding and not understanding. Finally, when proficient at introspective understanding, he can move to the higher level and attempt to understand his successful and unsuccessful efforts at introspective understanding'. The entire project is no mean task…It is concretely emphasized…by indications of time and lifetime. I have spent many months struggling self-attentively towards an understanding [of experiences of understanding]. I have spent several years introspecting my insights in physics, chemistry and biology in order to bring me to some appreciation of the autonomy or non-reducibility of botany.
>
> Obviously, if there are scientific insights within this area of self-attention, they are no more communicable in brief than the insights of Quantum Theory can be communicated in a short course in physics.
>
> (McShane 1976: 11–12).

Research as asking and answering questions

One starting point is to consider our questions. All housing research begins with a researcher asking some sort of question. While this question is about something, the question itself has its origins in the researcher. The question emerges within a context of other larger questions and an answer to this question will make some contribution to these larger questions. On the other hand, the question guides a

particular research project and within it lays a series of secondary questions whose answers will provide some contribution to answering this question.

Method presupposes a question to be answered. And different methods are used to answer different questions. Unfortunately, as William Mathews (1987: 249) comments: 'Philosophers of science, with their concern with verification and falsification, or the social framework of scientific inquiry, have not paid nearly enough attention to the anticipatory structures of scientific questions.'

Books on research methods and the philosophy of social science devote little attention to 'questions' (apart from questions within questionnaires) and rarely include a reference to 'questions' in their indexes (see, for example, Flick et al. (2004), Danermark et al. (2002), Winch (2003) and Sayer (2010)). De Vaus (2002) has some initial discussion of 'research questions' but not in relation to the anticipatory structure of different types of questions. As discussed below, Blaikie (2003: 13ff; 2007: 6f) is one exception.

In our everyday living, we ask all sorts of different questions which emerge from within us as we puzzle about something. We are puzzlers, and questions as thought and formulated emerge as expressions of this puzzling, as expressions of our desire to understand and to solve problems. They reveal something about our dynamic orientation towards understanding and responding. They emerge in response to something that we are interested in or care about or are puzzled by.

As in everyday living, housing researchers ask all sorts of questions about different topics. For instance, Jacobs et al. (2010b) in an AHURI research project on the future of public housing ask:

> What problems have arisen for the SHAs as a result of trying to manage housing stock in a period of tight budgetary constraints?
>
> How have the major drivers shaping public housing provision (social, economic and political) affected its future role?
>
> How might or should the SHAs prepare for the future policy environment to ensure that funds spent on public housing achieve sustainable policy outcomes?
>
> To what extent is public housing viable in the current policy environment?
>
> What alternative models of provision might be used in the future to enhance the broader role of public housing?

Or again, McNelis et al. (2008) in another AHURI research project on older persons in public housing ask:

> What are the characteristics and housing circumstances of older public housing tenants?
>
> What is the likely future demand for public housing from older persons over the next ten years?
>
> What are the housing policy and management issues associated with older tenants?

> What is the role and responsibilities of SHAs in facilitating the access of older people to support services, in particular, to aged care?
>
> What examples of good practice and policy initiatives are there among social housing providers in Australia and overseas?

Like these two examples, a research project will consist of different sorts of questions about a particular topic. What is happening? Why has it happened? Who are the major players and what are their characteristics? Who is doing what? What are the current issues or problems? How can we make things better? How is power being exercised? How has something changed? What is its history? What is driving change? What are its prospects for the future? Who is responsible for what has happened and for what might happen in the future? etc.

Asking questions in the context of everyday living (where immediate practical responses are called for) is very different from asking questions in a scientific context. In the first place, in the context of everyday living we are apt to ask the same question in different ways. In this context, this is acceptable. However, in a scientific context, we need to be more precise about the questions we ask. In the second place, in the context of everyday living we are apt to focus on one particular question or even a couple of questions, either to the exclusion of other questions or without recognising how one relates to another.

By focusing on and enquiring into the anticipatory structure of questions we can be much more precise about (i) the intent of our question and (ii) the relationship between one question and another question, and we can (iii) work towards a complete set of questions.

Norman Blaikie in *Analyzing Quantitative Data: From Description to Explanation* (2003) proposes that:

> Research questions are of three main types: 'what' questions, 'why' questions and 'how' questions:
>
> 'What' questions seek descriptive answers.
>
> 'Why' questions seek understanding or explanation.
>
> 'How' questions seek appropriate interventions to bring about change.
>
> All research questions can and perhaps should be stated as one of these three types. To do so helps to make the intentions of the research clear. It is possible to formulate questions using different words, such as, 'who', 'when', 'where', 'which', 'how many' or 'how much'. While questions that begin with such words may appear to have different intentions, they are all versions of a 'what' question: 'What individuals...', 'At what time...', 'At what place…', 'In what situations...', 'In what proportion...' and 'To what extent...'. (p.13)

For Blaikie, social research can pursue one of a set of eight objectives – explore, describe, understand, explain, predict, change, evaluate and assess social impacts – with the first five being characteristic of basic research and the last three of applied research. These follow a sequence, with the 'core of all social research

[being] the sequence that begins with the *description* of characteristics and patterns in social phenomena and is followed by an *explanation* of why they occur' (pp.11–12, see also Blaikie 2007).

If, however we consider our questions more closely, we will find that a range of different types (according to the answer they anticipate) emerge from within us as we puzzle about something.

- what-is-it-questions anticipate that there is something to be understood, something to be made sense of. They anticipate an insight into something within our experience such that we will reach some understanding of the 'what' under consideration;
- purpose-questions anticipate that this 'what' serves some purpose or role;
- is-it-questions seek a judgement as to whether or not this particular event is the occurrence of a 'what';
- change-questions anticipate an understanding of what is going forward in the development of the 'what' under consideration;
- how-often-questions anticipate a frequency, the occurrence of the 'what' so many times within a group or class or population of events;
- is-it-worthwhile-questions seek an evaluation as to whether it is worth the effort creating this 'what';
- what-do-I-do-questions anticipate a course of action within which the 'what' is not simply understood but will be created.

While Blaikie specifies only three types of research questions, this indicates a broader range. Many researchers highlight why-questions as seeking an explanation and Blaikie notes that 'some questions that begin with 'what' are actually 'why' questions. For example, 'What makes people behave this way?' seeks an explanation rather than a description. It needs to be reworded as: 'Why do people behave this way?'' (2003: 13). So, it is notable that none of the questions in the above set asks a why-question. This is because why-questions intend different answers and we need to distinguish between different types of why-questions. Why is a house, a house? (i) because it consists of certain materials – bricks, timber, concrete etc., (ii) because these materials are ordered in a certain way, (iii) because it was built by a group of people and (iv) because it meets some purpose (McShane 2003; see also Aristotle [*c*.322BC] 2007b: Book II, Section 3). These different answers to a why-question point to different types of causes: material cause, formal cause, efficient cause and final cause.[3] As such, why-questions reflect different types of questions.

The questions above are not a definitive list. It still needs some refinement, but it does begin to sort questions into their basic types and so, we can be more precise about our questions and the answers we are anticipating. Moreover, we can note that some questions presuppose some answer to others, i.e. that there is some order and some relationship between questions. For instance, all these questions presuppose an answer to a what-is-it-question. So, before we can answer a what-do-we-do-question to create housing, we need to know what

housing is, we need to know what purpose or role it plays and have decided that it is worthwhile promoting or creating; before we answer an is-it-worthwhile-question, we need to know what is housing that we are deciding about; before we answer a how-often-question or an is-it-question, we need to know whether it is housing that is occurring and distinguish its occurrence from the occurrence of something else. A what-is-it-question, then, provides a context for answering further questions.

A proposal for a scientific approach to housing research

In his introduction to *Housing and Social Theory*, Kemeny (1992: xviii) referring to 'a sociology of residence' notes that

> [t]heorising is not merely the mechanical application of ideas from one field to another. It is essentially the use of what C Wright Mills called 'the sociological imagination': calling into question aspects of social structure that tend to be taken for granted and using fantasy and lateral thinking in the craft of sociology to solve problems, often reformulated in novel ways.

And as Herbert Marcuse notes: 'Without fantasy, all philosophic knowledge remains in the grip of the present or the past and severed from the future, which is the only link between philosophy and the real history of mankind' (1968: 155).

Using 'fantasy and lateral thinking' in relation to a scientific approach to housing research, I propose to take the methods of housing researchers and reformulate them in a novel way. So, Functional Collaboration will be discontinuous with past understandings of housing research. Thus, in some sense, Functional Collaboration could be described as a fantasy, a vision of the future, an anticipation of something new. Here it may be worthwhile keeping in mind some of the great discoveries of the past. For example, Mendeleev discovered the periodic table in chemistry. Prior to this event, chemical processes already operated and chemists had developed some understanding of these processes. Mendeleev, however, through 'fantasy and lateral thinking' leapt to a new understanding and formulation of the whole of chemistry which incorporated all the elements, their structure and their relationship to one another. Once understood, the periodic table became the foundation for modern chemistry and opened up a vast range of possibilities to human ingenuity.

Functional Collaboration is not a fantasy in the idealist sense of dreaming of some future utopia. Rather, it is an attempt to formulate a discovery of something that already operates (albeit confusedly) – how human history brings about progress – the elements, their structure and their relationship to one another. An understanding of this discovery anticipates opening up a vast range of possibilities in any area of human endeavour.

So, what follows is an invitation to 'fantasy and lateral thinking' that operates on two levels. On one level, it requires the housing researcher to have some understanding of the variety of methods used in housing studies; it requires the

housing researcher to ask: what am I doing when I am using this method? how does this method relate to other methods? and, how can I integrate these various methods into a single whole? On a second level, it requires a housing researcher to pay attention to the type of question underlying each method and so begin (i) to differentiate different types of questions, (ii) to grasp what each question anticipates, (iii) to grasp what they are doing in the process of answering each type, i.e. the method by which an answer is sought to each question, (iv) to relate each type of question to the others and (v) to affirm that it is by seeking new answers to all these questions that we can make some progress in understanding some housing issue and in understanding the method by which we reached this understanding.

In housing research we can ask a range of different types of questions and here I want to propose that a scientific approach to housing would seek to incorporate all the questions that could be asked of housing. It would be a complete set of questions; the questions would have a certain order; the questions would be inter-related with each question understood in the context of all the other questions and thus in relation to one another. Further I want to propose that each type of question is a stage in the process from understanding the current situation to implementing something new; that each type of question anticipates a particular type of answer – it has a defined purpose; that each type of question is answered through a particular method; and that the question and purpose of each stage provides the grounds for a division of labour into functional specialties and for a new form of collaboration between housing researchers. Table 3.1 outlines the eight functional specialties, the corresponding type of question that each functional specialty seeks to answer through a particular method and a description of the corresponding purpose of each functional specialty.[4]

Table 3.1 Functional specialty, type of question answered and a description of its purpose

Functional Specialty	*Type of questioned answered*	*Description of purpose*
Research functional specialties: understanding the past		
Research	Empirical question	Gathering and making available the relevant data
Interpretation	Theoretical question	Understanding what is being investigated
History	Historical question	Understanding what is going forward
Dialectic	Evaluative/critical question	Coming up with the best story and the best basic directions

Table 3.1 continued

Functional Specialty	*Type of questioned answered*	*Description of purpose*
Implementation functional specialties: looking to the future		
Foundations	Transformative/ visionary question	Expressing the best fundamental directions – working towards a better basis upon which researchers can operate
Policies	Policy question	Reaching for new guidelines and directions for change
Systematics	Strategic question	Integrating possible directions for change with other theories/other aspects of society
Communications	Practical question	Working out specifically how strategies can be applied within the local context of roles and institutions.

Table 3.1 describes the different parts of a scientific approach to housing. Rather than a descriptive definition of science, however, Part II works towards a more precise understanding of each functional specialty while Part III shows the relationship between the functional specialties such that functional specialties constitute a theory or explanatory definition of science.

Notes

1 See, for example, Husserl (1970), Popper (2002), Rorty (1989), Feyerabend (1993), Kuhn (1970), Lakatos (1970, 1978), Feyerabend (1993), Winch (2003), Giddens (1979, 1993), Bhaskar (2008), Blaikie (2007) and Sayer (2010).

2 Crotty (1998: 2), for example, argues that 'four questions are basic elements of any research process': What *methods* do we propose to use? What *methodology* governs our choice and use of methods? What *theoretical perspective* lies behind the methodology in question? What *epistemology* informs this theoretical perspective?. Answers to these questions will determine the specifics of this standard social research model that I have outlined here.

3 In his *Posterior Analytics* ([*c.*322BC] 2007a: Book II, Section 1), Aristotle discusses different types of question. He also discusses how an understanding of the *whatness* of something is the same as understanding the *why* of it (see his discussion of understanding the eclipse of the moon in Book II, Section 2).

4 These terms (with the initial letter in upper case) have a technical meaning. As functional specialties, 'Research' and 'Policies' should not be confused with how these terms are generally used. Their more technical meaning is outlined in Part II.