

This chapter will explore:

- the purpose of research questions and where they come from
- different kinds of research questions
- devising your research question(s)
- making your research question answerable
- how many research questions you should have

### 10.1 Why have research questions?

Research design includes a concrete and specific statement of the aims and objectives of the research as set out in the overall research purposes. There is a move in the research design from the general to the specific and concrete. From these specific, concrete objectives the researcher can formulate direct, concrete, specific research questions that the research will answer specifically and concretely and, thereby, address the objectives of the research. Research questions get to the heart of the research issue.

For many kinds of research, the framing of the research question(s) is critical; it focuses, centres, shapes, steers and drives the entire research and it is the answers to the research questions in which the researcher is interested. As Alvesson and Sandberg (2013) remark, research questions concern the direction of a study and what it is about (p. 2). They strive to ‘tame curiosity’ (White, 2013, p. 213) and to shape and direct the research (Agee, 2009), to make the research topic tractable. Research questions might raise a problem and shape it into a testable question or hypothesis and enable the results to be reported; they inform the direction of the research in substantive, contextual, theoretical and methodological terms; in other words, they indicate what the research is really about and what it must address.

Research questions are not the start of the research; typically they stem from the overall research purposes, objectives and design. They are the concrete questions, carefully composed in order to address the research objectives, to constitute a fair operationalization and embodiment of a valid set of indicators for addressing

the research objectives, providing answers which address the research purposes with warranted data. Research questions render research aspirations, in principle, researchable and able to be investigated scientifically and rigorously, and answered empirically or by appropriate non-empirical means. We say ‘in principle’ because other factors, for example, practical matters such as access, permissions, finances and resources (human, material, temporal, administrative), may obstruct the research progress. Research questions take the purposes and objectives of the research and narrow them down into specific, concrete areas of focus; they narrow the boundaries of the research and help the researcher to decide where to go in the research.

This chapter does not distinguish between qualitative and quantitative research, as the issues raised apply to both. It is invidious to suggest that certain issues apply only to quantitative research and that others apply only to qualitative research; the issues apply to both types, and, indeed, mixed methods research demonstrates this very clearly, drawing on different kinds of research and data in order to answer a particular research question. For example, Simon (2011) notes that qualitative research questions tend to be exploratory and open in nature (p. 1), but there is no reason why this cannot apply to quantitative research.

Research questions typically precede the specification of research designs, methodologies, data types, methods of data collection, instrumentation and sampling, i.e. the logistical aspects of the research and which follow from the research questions.

### 10.2 Where do research questions come from?

Research questions stem from the aims, purposes and objectives of the research. Research questions turn a general purpose or aim into specific questions to which specific, data-driven, concrete answers can be given. This is the process of operationalization of the aims and purposes into research questions. Researchers must ensure that there is an alignment between the aims and objectives of the research and the research questions,

such that the latter serve the former. The research questions must yield data that provide warrantable evidence to address the research purposes and objectives and to draw conclusions. They must follow logically from the research purposes and objectives, and the data used in answering them must be reliable and valid indicators of the evidence needed to answer the research purposes and objectives.

It is the answers to the research questions that can provide some of the ‘deliverables’ referred to in Chapter 9. A useful way of deciding whether to pursue a particular study is to ascertain the clarity and ease with which research questions can be conceived and answered. Leong *et al.* (2012) argue that, in constructing research questions, it is important to have: (i) knowledge of the literature on the topic (research literature, theoretical literature); (ii) an awareness of the implications, practicability and limitations in conducting the research; and (iii) an integration of (i) and (ii). Whereas the overall research identifies the *field*, the *main topic* and *direction* of the research, the research question asks for specific, explicit answers from the outcomes of the research (p. 34).

For example, take the issue ‘why do females have higher scores than males in international tests of reading at age 14?’; here the research questions might ask: (a) ‘what are the test scores of females and males in such-and-such an international test of reading comprehension at age 14 in such-and-such a country?’; (b) ‘how consistent among different sub-groups of females and males are the scores in such-and-such an international test of reading comprehension at age 14 in such-and-such a country?’; (c) ‘how much variation is there in the scores of females and males in the scores in such-and-such an international test of reading comprehension at age 14 in such-and-such a country?’; and (d) ‘what reasons do the test designers and data give for the answers to (a), (b) and (c)?’. Here the initial single overall question generates several research questions; this is common, as one of the purposes of a ‘good’ research question is to take a particular objective of the research and render it concretely researchable and practicable (White, 2009, p. 34).

### 10.3 What kinds of research question are there?

Questions such as ‘what is happening?’, ‘what has happened?’ ‘what might/will/should happen?’ open up the field of research questions. Chapter 6 also mentioned causal questions; ‘what are the effects of such-and-such a cause?’ and ‘what are the causes of such-and-such an effect?’ are two such questions, to which can be added

the frequently used questions ‘how?’ and ‘why?’. These questions ask for explanations as well as reasons. De Vaus (2001, p. 1) notes that there are two fundamentals of research questions: ‘what is going on?’ (description) and ‘why is it going on?’ (explanation). These are useful pointers when starting to think about research questions.

A useful approach to framing different kinds of research questions can be to ask questions that start with: what; what if; who; when; where; which; whence; whither; why; and how. There are many categories or types of research question. An early typology of these stem from Dillon (1984) who identified seventeen types of research question, which he refined into four main types: descriptive, explanatory, comparative and normative. His ‘first order’ type addresses ‘properties’ (p. 330): existence, identification, affirmation, substance, definition, character, function and rationale. His ‘second order’ type concerns ‘comparisons’: concomitance, conjunction and disjunction, equivalence and difference. His ‘third order’ type concerns ‘contingencies’: relations, correlations, conditionality (consequence and antecedence) and causality. His ‘extra order’ type concerns deliberation (normative questions), and other attributes. He arranges these in a hierarchy, with causal questions at the apex, being closest to the purpose of scientific inquiry.

Flick (2009) differentiates questions concerning describing states (what they are, how they came about, how they are sustained) from those describing processes (how and why something develops or changes) (p. 102). He also distinguishes between those questions which seek to confirm existing hypotheses or assumptions and those which seek to discover or allow new assumptions or hypotheses (p. 102), the latter being Strauss’s (1987) ‘generative questions’, which are those that ‘stimulate the line of investigation in profitable directions; they lead to hypotheses, useful comparison, the collection of certain classes of data, even to general lines of attack on potentially important problems’ (Strauss, 1987, p. 22).

Agee (2009, p. 433) reports four kinds of research question: exploratory, explanatory, descriptive and emancipatory. Denscombe (2009a) identifies six types, articulated with their concern: description, prediction, explanation, evaluation, development-related and empowerment. De Vaus (2001) adds ‘comparison’ to these. Research questions can concern, for example:

- prediction (‘what if’ and ‘what will’ types of question), understanding, exploration, explanation (reasons for: ‘why-type’ questions; ‘how-type’ questions), description (‘what-type’ questions) and causation;

- testing and evaluation;
- comparisons/relations/correlations (between variables, people, events);
- processes, functions and purposes; stages of something;
- factors, structures, properties and characteristics of something;
- classification, types of something, trends and patterns;
- how to achieve certain outcomes; how to do, achieve, improve and develop something; alternatives to something;
- empowerment (of individuals and groups).

White (2009, pp. 42–4) argues that ‘metaphysical questions’ (those which cannot be answered completely through empirical research and observation) and ‘normative questions’ (those concerning judgements of values, what ‘should’ or ought to be the case or should happen, ethical and moral matters: what is desirable, good, bad, right, wrong, defensible) are typically beyond the scope of empirical social science, being ‘deliberative’ questions (p. 43) to which there are multiple answers deriving from people’s opinions. Similarly, Hammersley (2014) comments that such questions are out of court for social scientists. Social science, he avers, should concern itself with factual data (descriptions and explanations), and social scientists have no more authority than others to determine what is good or bad (pp. 94, 144).

## 10.4 Devising your research question(s)

Research questions should enable the researcher to make a significant and innovative contribution to the field of study, say something new and interesting and contribute to the concerns and current topics in the academic community (see Chapter 4). Researchers should check that their research question will yield useful, relevant and significant data on matters that recipients (widely defined) of the research will care about (the ‘so what?’ criterion). It is also useful to consider whether the research question is ‘gap filling’, ‘neglect filling’, a new formulation of an existing idea or an entirely new idea, and how the facts which the answers to the research yield will match relevant theory.

Researchers need to decide exactly what they need to know about the matter in hand and make sure that, together, the research questions address all the required scope of the research. Though it sounds like common sense, it is important to check that it is possible to answer the research questions and that the answers to

the research questions stem from data. The research questions must be manageable, practicable and answerable, fully operationalized, with a clear delineation of their scope and boundaries, and that they can be answered within the time frame and scope of the research.

With regard to the formulation of the research questions there are several points to make:

- Make sure that the types of research questions are fit for purpose (e.g. descriptive, explanatory, causal, evaluative, exploratory etc.) and that the research questions suggest an appropriate methodology. Where relevant, ensure that your research questions will be amenable to formulating hypotheses.
- Make your research questions as brief, clear, specific, concise and precise as possible (no more than a single sentence) (White, 2009, pp. 66–70), ensuring that they address (a) the focus: the ‘what’; (b) the persons: the ‘who’ (the population and the sample as appropriate); (c) the location (the ‘where’); and (d) the timing (the ‘when’ or the (historical) period studied) of the research (pp. 71–2).
- If you have more than one research question, make clear the relationship (e.g. logical) between them and the relative status of each question (is one question more important than another, and, if so, why or do they have equal status?) (cf. Andrews, 2003, p. 35).
- If you have one research question with several subsidiary questions (discussed later in this chapter), make clear the relationship (such as logical, chronological, empirical) not only between the subsidiary questions but between them and the main research question. Identify the main research question and the contributing subsidiary research questions (if there are any) (cf. Andrews, 2003).
- Check whether some of your research questions are more general/specific than others, and, if so, why. Check the scope of the research question: make sure your research questions are very focused, neither too narrow nor too broad. Avoid questions that require a simply binary response (yes/no). Avoid personal pronouns in the research questions.

Lipowski (2008, p. 1669) suggests that researchers can examine the four s’s of research questions in order to determine their importance: size (the magnitude of an effect); scope (the overall effect on existing practice); scalability (how the findings may have expanded – wider – impact); and sustainability (long-term effects and support). It is useful to ask a colleague to review one’s research questions and to give feedback on them.

White (2009) provides some useful cautions in constructing research questions:

- Only ask one question at a time (p. 37). Avoid putting two questions into the same single question, as it is important to see which answer refers to which part of the question. For example, avoid putting into the same research question a ‘what’ and ‘why’ question; they are asking for two different kinds of response/data, for example, ‘what are the test scores of females and males in such-and-such an international test of reading comprehension at age 14 in such-and-such a country and how can we account for such findings?’. Combining descriptive, explanatory, causal, comparison, correlational, evaluative or other types of question into a single research question builds in questionable ambiguity. However, as discussed in Chapter 2, mixed methods research often suggests combining more than one question in a research question.
- Avoid ‘false dichotomies’ (p. 37). For example, in the question ‘is a country’s centralized university entrance examination a narrowing of the curriculum or a fair basis for comparing student performance?’, neither or both statements may be true, partially true, irrelevant, or, indeed, there may be a less polarized position.
- Avoid making false assumptions (p. 38). For example, in the question ‘why do males prefer multiple choice questions to essay questions in public English language examinations at age 16?’, there are suppressed assumptions that such a preference exists, that multiple-choice questions are all of a single type (and the same applies to essay questions), that English language examinations are of a single type, and so on – many questionable assumptions and ambiguities underlie the research question. Whilst it may be impossible, because language and terminology inherently carry ambiguities, to render research questions unambiguous, nevertheless the researcher should avoid making false assumptions; in other words, the assumptions made should be warrantable.
- Avoid tautological questions (p. 40), i.e. those questions which say the same thing in more than one way. For example, in the question ‘why do so many wealthy students study in elite universities?’, one of the criteria (among others, of course) for a university to be regarded as ‘elite’ is that it recruits from among the wealthy groups in society. In other words, the research question here could be rewritten as ‘why do so many wealthy students study in universities which recruit mainly wealthy students?’ As White (2009, p. 41) remarks, this type of question is redundant because it already supplies its answer.

One can add to these cautions:

- Avoid making the research question too broad. For example, a research question such as ‘what are the effects of such-and-such an intervention on students?’ is far too broad, and could be replaced by, for example: ‘how does such-and-such an intervention relate to sixteen-year-olds’ examination performance in mathematics?’.
- Avoid making research questions too simple. For example, ‘how are schools addressing student under-achievement?’ could be answered by a simple Internet search, whereas a more complex question could be ‘what are the effects of such-and-such an intervention in upper primary schools on the achievement of students at age 11?’.
- Avoid biased and leading questions (Agee, 2009), avoid ‘can’/‘how can’ questions, as these are hypothetical and limitless (Andrews, 2003, p. 34).
- Avoid making your research question your questionnaire question; the former is overall and the latter is specific (Andrews, 2003, p. 69).

Some authors set out a linear process of devising research questions (cf. Alvesson and Sandberg, 2013, pp. 21–2), for example:

- Step 1:* Identify the field of study/subject area.
- Step 2:* Identify a specific topic within the field of study.
- Step 3:* Identify the purpose of the particular study.
- Step 4:* Formulate a research question that relates to the specific topic which is of both theoretical and practical interest/concern.

Leong *et al.* (2012, p. 127) suggest an alternative sequence:

- Step 1:* Define the domain of the research.
- Step 2:* Identify the main factors in, attributes of, conceptual frameworks of, influences on, and practical implications of, the topic in question.
- Step 3:* Plan how to cover these main factors/attributes/influences/conceptual frameworks/implications in formulating your research question, including which ones to address or leave aside.
- Step 4:* Operate a convergent exercise in bringing steps (1) to (3) into a researchable question (the authors recommend mixed methods in preference to either quantitative or qualitative methods, as this is consistent with their advocacy of ‘multiple and convergent operationalism’).

However, Alvesson and Sandberg (2013) suggest that, in reality, the formulation of a research question is much more iterative, interactive and evolutionary than that which is set out in a simple linear approach, and includes greater reference to literature, current debates and policy concerns. Leong *et al.* (2012) advocate brainstorming ideas, from which practicable, interesting and novel research questions can be selected; this might involve connecting ideas that may not have previously been connected ('novel links') (p. 120) and trying to look at a phenomenon as an outsider might view it. In this respect, mixed methods may possess greater potential for effective research questions than mono-methods approaches (see Chapter 2).

Similarly, researchers should evaluate their research questions and be prepared to modify them either before or during the research (if appropriate). As research progresses, matters may arise which indicate that the initial research question was too broad, or that the focus needs to shift, or that a more specific question needs to be asked. Research questions can change over time, as the researcher becomes more immersed in the research and as the research unfolds over time. This is commonplace and is almost to be expected: as the research becomes more refined, so the research questions will become more refined. The point here is that, at the start of the research it is not always clear where the research will go, and this means that the research question(s) could well change over time as the phenomenon in question is unpacked.

Similarly, what the researcher initially planned or wished to do in the research may have to be modified as the actual research is negotiated or unfolds. As Chapter 13 makes clear, this is not uncommon in sensitive research, but it is not confined to that: what the researcher wishes to do and what he/she can do in reality are not the same, and this may affect the research questions. A range of practical constraints, such as time, resources, access, scope can lead to research questions being modified over time. Further, as the research unfolds, unforeseen avenues for important exploration may open up, or what the researcher had initially thought was the 'correct' research question may turn out to need modification in order to get to the heart of the matter. This, too, is not uncommon; indeed in some kinds of research (e.g. ethnographic and qualitative research) it may even be expected to occur.

Some research – often qualitative (Bryman, 2007b) – may not have research questions. Similarly, it is important to recognize that research methods are not always driven by the research questions (p. 18), and that one should avoid the 'dictatorship of the research questions' (p. 14) in steering the design and conduct

of the enquiry. Nevertheless, in many kinds of research the research questions figure significantly, and hence the chapter moves to considering their importance.

Some kinds of research (e.g. ethnography) might not begin with research questions but, in their closing stages, might use the open-ended research (e.g. an ethnography, interviews, focus groups) to raise research questions for further study in subsequent investigations. Such research, being exploratory in nature, might not wish to steer the inquiry too tightly, and indeed one of the features of naturalistic research (see Chapter 15) is that it endeavours not to disturb the everyday, natural setting for the participants. However, for many kinds of research, one of the early considerations that researchers can address in choosing a project is the research questions that the study might generate (or indeed should, as they derive from the overall purposes of the research).

In considering the proposed research, a useful approach is to brainstorm the possible areas of the field, moving from a general set of purposes to a range of specific, concrete issues and areas to be addressed in the research, and, for each, to frame these in terms of one or more research questions (or indeed in terms of a thesis to be defended or a hypothesis to be tested).

## 10.5 Making your research question answerable

There are many different kinds of research questions that derive from different purposes of the research. For example, research questions may seek:

- to describe what a phenomenon is and what is, or was, happening in a particular situation (e.g. in ethnographies, case studies, complexity theory-based studies, surveys);
- to explain why something happened;
- to predict what will happen (e.g. in experimentation, causation studies, research syntheses);
- to investigate what should happen (e.g. in evaluative research, policy research, ideology critique, participatory research);
- to examine the effects of an intervention (e.g. in experimentation, ex post facto studies, case studies, action research, causation studies);
- to examine perceptions of what is happening (e.g. in ethnography, survey);
- to compare the effects of an intervention in different contexts (experimentation, comparative studies);
- to test a theory or hypothesis;
- to develop, implement, monitor and review an intervention (e.g. in participatory research, action research).

In all of these the task of the researcher is to turn the general purposes of the research into actual practice, to operationalize the research. We discuss the process of operationalization in Chapter 11. In the present chapter we note that operationalization in terms of research questions means moving from very general, broad questions to very specific, concrete, practicable questions to which specific answers can be given. Thus the researcher breaks down each general research purpose or general aim into more specific research purposes and constituent elements, continuing the process until specific, concrete questions have been reached to which specific answers can be provided. This is not unproblematic; for example, Leong *et al.* (2012) note that operationalization, whilst valuable, may be prone to rendering issues biased or simplistic, and that, to overcome this, it is important to consider multiple perspectives on, and methodologies for researching, the topic (triangulation) (p. 127). Two examples of operationalization are provided below.

Let us imagine that the overall research aim is to ascertain the continuity between primary and secondary education (Morrison, 1993, pp. 31–3). This is very general, and needs to be translated into more specific terms. Hence the researcher might deconstruct the term ‘continuity’ into several components, for example, experiences, syllabus content, teaching and learning styles, skills, concepts, organizational arrangements, aims and objectives, ethos, assessment. Given the vast scope of this, the decision is taken to focus on continuity of pedagogy. This is then broken down into its component areas: the level of continuity of pedagogy; the nature of continuity of pedagogy; the degree of success of continuity of pedagogy; the responsibility for continuity; record-keeping and documentation of continuity; resources available to support continuity.

The researcher might take this further into investigating: the *nature* of the continuity (the provision of information about continuity); the *degree* of continuity (a measure against a given criterion); the *level of success* of the continuity (a judgement). An operationalized set of research questions, then, might be:

- How much continuity of pedagogy is occurring across the transition stages in each curriculum area? What kind of evidence is required to answer this question? On what criteria will the level of continuity be decided?
- What pedagogical strategies operate in each curriculum area? What are the most frequent and most preferred? What is the balance of pedagogical strategies? How is pedagogy influenced by resources? To what extent is continuity planned and recorded? On what criteria will the nature of continuity be

decided? What kind of evidence is required to answer this question?

- On what aspects of pedagogy does planning take place? By what criteria will the level of success of continuity be judged? Over how many students/teachers/curriculum areas will the incidence of continuity have to occur for it to be judged successful? What kind of evidence is required to answer this question?
- Is continuity occurring by accident or design? How will the extent of planned and unplanned continuity be gauged? What kind of evidence is required to answer this question?
- Who has responsibility for continuity at the transition points? What is being undertaken by these people?
- How are records kept on continuity in the schools? Who keeps these records? What is recorded? How frequently are the records updated and reviewed? What kind of evidence is required to answer this question?
- What resources are there to support continuity at the point of transition? How adequate are these resources? What kind of evidence is required to answer this question?

It can be seen that these questions, several in number, have moved the research from simply an expression of interest (or a general aim) into a series of issues that lend themselves to being investigated in concrete terms. This is precisely what we mean by *operationalization*. The questions above also deliberately avoid the precision that one might be seeking in some research questions, such as the delineation of the locale of the research and the schools in question.

It is now possible to identify not only the specific questions to be posed, but also the instruments that might be needed to acquire data to answer them (e.g. semi-structured interviews, rating scales on questionnaires, or documentary analysis). By operationalization we thus make a general purpose amenable to investigation, be it by measurement or some other means. The number of operationalized research questions is large here, and may have to be reduced to maybe four or five at most, in order to render the research manageable.

Take another example of operationalizing a research question: ‘do students work better in quiet rather than noisy conditions?’ Here it is important to define who are the ‘students’, what is meant by ‘work better’, ‘quiet’ and ‘noisy’. ‘Students’ might be fifteen-year-old males and females in school, ‘work better’ might mean ‘obtain a higher score on such-and-such a mathematics test’, ‘quiet’ might mean ‘silence’, and ‘noisy’ might mean ‘having moderately loud music playing’. Hence the fully operationalized research questions might be ‘do fifteen-year-old male and female students in school obtain a

higher score on such-and-such a mathematics test when tested when there is silence rather than when there is moderately loud music playing?’ Now we have defined – and thereby narrowed – the scope, terms, field, focus, location, participants, indicators (a measurable score) and the conditions (silence and moderately loud music).

In this example the process of operationalization is to break down the constructs (or abstract terms) in question into component variables (categorical, continuous, dependent and independent), which, as the term suggests, can vary, and which are describable, observable and, in this case, measurable.

## Hypotheses

An alternative way of operationalizing research questions takes the form of hypothesis raising and hypothesis testing. A ‘good’ hypothesis has several features:

- It is clear on whether it is directional or non-directional: a directional hypothesis states the kind or direction of difference or relationship between two conditions or two groups of participants (e.g. students’ performance increases when they are intrinsically motivated). A non-directional hypothesis simply predicts that there will be a difference or relationship between two conditions or two groups of participants (e.g. there is a difference in students’ performance according to their level of intrinsic motivation), without stating whether the difference, for example, is an increase or a decrease. (For statistical purposes, a directional hypothesis requires a one-tailed test whereas a non-directional hypothesis uses a two-tailed test; see Part 5.) Directional hypotheses are often used when past research, predictions or theory suggest that the findings may go in a particular direction, whereas non-directional hypotheses are used when past research or theory is unclear or contradictory or where prediction is not possible, i.e. where the results are more open-ended.
- It is written in a testable form, that is, in a way that makes it clear how the researcher will design an experiment or survey to test the hypothesis (e.g. ‘fifteen-year-old male and female students in school obtain a higher score on such-and-such a mathematics test when tested when there is silence rather than when there is moderately loud music playing’). The concept of interference by noise has been operationalized in order to produce a testable hypothesis.
- It is written in a form that can yield measurable results.

Here it is a small step from a research question to a research hypothesis. Both specify and manipulate

variables. In the example above, converting the research question into a hypothesis leads to the following hypothesis: *people work better in quiet rather than noisy conditions*. The fully operationalized hypothesis might be *fifteen-year-olds obtain a higher score on a mathematics test when tested when there is silence rather than when there is music playing*. One can see here that the score is measurable and that there is zero noise (a measure of the noise level).

In conducting research using hypotheses, one has to be prepared to use several hypotheses (Muijs, 2004, p. 16) in order to catch the complexity of the phenomenon being researched, and not least because mediating variables have to be included in the research. For example, the degree of ‘willing cooperation’ (dependent variable) in an organization’s staff is influenced by ‘professional leadership’ (independent variable) and the ‘personal leadership qualities of the leader’ (mediating variable) which needs to be operationalized specifically.

There is also the need to consider the null hypothesis and the alternative hypothesis (discussed in Part 5) in research that is cast into a hypothesis testing model. The *null hypothesis* states that, for example, there is *no* relationship between two variables, or that there has been *no* difference in participants’ scores on a pre-test and a post-test of history, or that there is *no* difference between males and females in respect of their science examination results. The *alternative hypothesis* states, for example: there *is* a correlation between motivation and performance; there *is* a difference between males’ and females’ scores on science; there *is* a difference between the pre-test and post-test scores on history. The alternative hypothesis is often supported when the null hypothesis is ‘not supported’: if the null hypothesis is not supported then the alternative hypothesis is. The two kinds of hypothesis are usually written thus:

$H_0$ : the null hypothesis  
 $H_1$ : the alternative hypothesis

We address hypothesis-testing fully in Part 5, particularly Chapters 38 and 39.

Contrary to statements that hypotheses are the province of only quantitative methods, we hold that hypotheses can be developed and tested in both quantitative and qualitative research; we see no reason why not. Nor do we concur with the view that a ‘variable’ is not a property of qualitative research. Theories and hypotheses can be tested in both qualitative and quantitative research, singly and together, and variables can comfortably be found and explored in both types (cf. White, 2013, p. 231). There is no exclusivity.

## 10.6 How many research questions should I have?

Whilst there are no hard and fast rules, a general principle is to have as few as necessary, but no fewer. Some researchers suggest having only one central research question with or without several subsidiaries (e.g. Andrews, 2003; Simon, 2011; Creswell, 2012). Others suggest no more than three or four (e.g. White, 2009); Creswell (2012) also suggests five to seven in qualitative research, whilst yet others (e.g. Miles and Huberman, 1994) extend this into double figures.

Andrews (2003) is very clear that there should be only one main research question, though a main research question may require ‘subsidiary questions’ (which are more specific and contribute to the answer to the main research question; p. 26) and ‘ancillary questions’ (which may not answer the main research question but which may be a consequence of, lead on from or broaden out the main research question; p. 81). Subsidiary questions, he avers (p. 43), are those that are ‘*on the way*’ (his italics) to answering the main research question, whilst ancillary questions (those that provide useful but not strictly necessary material to answer the main research question) flow from, rather than contribute to, the main research question (p. 81). He cautions against having more than one main research question and, indeed, against having too many subsidiary questions, as these risk making the study too broad or ambitious in scope.

Whether one has several research questions or one research question with one or more subsidiary questions, Andrews (2003, p. 80) makes the important point that it is essential to establish the relationship (e.g. logical, chronological) between them and to identify which are the main questions and which questions are closely related or more distantly related to each other (p. 80), and how and why. His suggestion of having only one main research question is useful in identifying and focusing on the key purpose of the research.

Answering ‘how many research questions do I need?’ concerns the purposes of the research, the research

design, the scope and magnitude of the research and each research question (and, where relevant, its subsidiaries and ancillaries) and, hence, its manageability. If the researcher wishes to avoid Andrews’ suggestion of only a single, main research question, a general guide might be to have no more than four main research questions (though some would suggest that this is too many) with only two or three subsidiaries for each, but this is highly contestable and others would argue for fewer. If you have too many research questions then this might indicate that the scope of the research is too broad and ambitious, is impractical, lacks focus, lacks precision and specificity, is poorly operationalized and is insufficiently thought through. In our experience, many novice researchers have maybe three research questions, but this is very fluid.

Many studies may have one research question that asks for descriptive data, together with another that asks for explanations (causal – why – or ‘how’ questions), together with a third that asks for the implications/recommendations that derive from the answers to the preceding two research questions, moving from description to analysis/explanation to evaluation/implications/recommendations, i.e. three research questions (cf. Gorard, 2013, p. 37). Or the research questions may comprise: (i) a question that asks for descriptive data (what, who, where, when); followed by (ii) a question that requires comparisons, differences, relations to be drawn; followed by (iii) a question that asks ‘so what?’ (implications and recommendations).

## 10.7 A final thought

Researchers may wish to ponder on whether they want to embark on investigations that have no clearly defined research questions (cf. Andrews, 2003, p. 71) or indeed any research questions, for example an ethnography, a naturalistic observational study, studies in the humanities and arts (p. 71), or qualitative research (Bryman, 2007b). A research question may lead to a subsequent hypothesis, but that is an open question.



### Companion Website

The companion website to the book provides PowerPoint slides for this chapter, which list the structure of the chapter and then provide a summary of the key points in each of its sections. This resource can be found online at: [www.routledge.com/cw/cohen](http://www.routledge.com/cw/cohen).