This is the ideal book for any research methods course in the area of sociolinguistics and discourse analysis. The coverage is extensive and comprehensive—from how to write your research questions to how to collect, analyse and interpret your data—written in a very accessible style by well-established young scholars whose enthusiasm for their topics is infectious. With its captivating examples and practical advice (including how to use basic statistical tests), it will prove a boon both to students and experienced researchers.

Janet Holmes, Professor of Linguistics, Victoria University of Wellington, New Zealand

"With its comprehensive coverage, this refreshing book provides a useful guide for doing research alongside thoughtful discussion of key research issues. As well as traditional qualitative and quantitative approaches, chapters cover corpus research, various forms of discourse analysis, narrative analysis, multimodal analysis, linguistic ethnography and much more. It will be essential reading for both beginning students and experienced researchers."

David Barton, Professor of Language and Literacy, Lancaster University, UK

An impressive collection that brings together a wide range of methods and analytical approaches in the study of language use. Chapters cover "the basics", including extensive illustration, while also exploring problems, controversies and debates within the field. A valuable resource for research students in linguistics.

Joan Swann, Senior Lecturer and Director of the Centre for Language and Communications, Open University, UK

Research Methods in Linguistics guides the reader through the key issues, principles, and contributions of core methods in linguistic research. It is an essential resource for researchers and research students looking for clear introductions to key concepts, accessible discussions of theory and practice through illustrative examples, and critical engagement with current debates.

Topics include developing research questions, combining methods, quantitative research designs (including questionnaires, chi-square tests and t-tests), corpus analysis, qualitative research methods (discourse analytic approaches, linguistic ethnography, interviews and focus groups, multimodal analysis, and narrative analysis).

With each chapter offering an overview of key issues, many examples from recent linguistic research, and suggestions for further reading, this book will be an invaluable resource for anyone working with linguistic data.

Lia Litosseliti is Senior Lecturer in Linguistics at City University, London, UK. She is the author of Using Focus Groups in Research (2003) and Gender and Language: Theory and Practice (2006).
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Introduction
Lia Litosseliti

'I have yet to see any problem, however complicated, which, when you looked at it the right way, did not become still more complicated.' This quote by author and scientist Poul Alderson would seem apt for a book on research methods. My aim in putting together this particular book, however, is to strike an important balance: while aiming to retain and illuminate some of the complexities of research inquiry within linguistics, it tries to do so in an accessible, uncomplicated way.

The ten chapters presented here guide readers through the key issues, principles, and contributions of core methods in linguistic research. The ideas presented by these authors are currently spread in the literature across different journals and books, and therefore this collection is aimed as an essential up-to-date one-stop resource for researchers and graduate students. The newcomer to the field will appreciate the clear introductions to key concepts, a plethora of illustrative examples, and carefully drawn links between theory and practice. The experienced researcher and teacher of linguistics will find authoritative and critical engagement with current debates in this diverse field (especially in the later chapters). Both types of readers will hopefully find the book a useful resource for the supervision of research projects and theses.

The book does not purposefully examine the different stages of project design, data collection and data analysis in linguistics. This is not only because the different chapters are designed to appeal to both experienced and new researchers, but also because there are already excellent guides doing precisely this. However, it will be evident for the reader that issues of design, collection, and analysis of data are central to any discussion of methods, and are therefore in the foreground in most of the chapters in this collection (and especially in the earlier chapters). As such, the book could also be used alongside other texts: comprehensive guides (such as 'Projects in Linguistics' by Wray and Bloomer, 2006); more specific introductions (e.g. Dörnyei's 2007 'Research
Research Methods in Linguistics

Methods in Applied Linguistics'); and related textbooks (e.g. existing texts on research methods in education, and research methods in language learning).

The book is organized in three parts:

- Issues
  - Quantitative and Corpus Research Methods
  - Qualitative Research Methods

This division is followed here for easy reference purposes; it will be clear to readers not only that some methods cannot be labelled as simply quantitative or qualitative, but also that there are good reasons why they should not be (and a number of contributors in this volume engage with these debates). The larger number of chapters under qualitative methods reflects the considerable prevalence and momentum of such methods currently in the field. However, I absolutely concur with the editors of the new sociolinguistics reader, who state that it is important to resist associating qualitative research with research that is 'new' and 'better informed', and conversely quantitative research with research that is 'old' or 'naive' (Coupland and Jaworski, 2009: 19).

Each chapter begins with a chapter outline, and then:

- introduces basic concepts and overviews key issues
- features illustrative examples from recent linguistic research studies
- outlines the contribution a method makes to the field, and where appropriate, its potential for combination with other methods
- makes suggestions for further reading in that particular area

Research methods are inextricably linked with the research questions being asked, as well as with the broader research climate in which they are employed. In this light, the first two chapters (Part I) examine some basic principles behind research questions and behind common assumptions about quantitative and qualitative methods. These chapters will be of interest particularly to the newcomer to the field, but will also act as reminders for the more experienced linguists, who are arguably more in danger of becoming entrenched in the research questions and types of methodologies they pursue.

Chapter 1, by Jane Sunderland, looks at research questions: why we need them, where they come from, how they can be categorized and implemented, and what implications they may have for linguistic data and analysis. This chapter offers plenty of examples of types and groupings of research questions from previous sociolinguistic studies.

Jo Angouri, in Chapter 2, critically examines the issue of the combination or integration of quantitative and qualitative methods in linguistic research. The chapter includes a discussion of triangulation and mixed methods, and uses research on workplace discourse to illustrate some of the benefits and challenges of combining paradigms.

The next three chapters (Part II) deal with quantitative and corpus research methods in linguistics. They are intended as detailed overviews of basic quantitative and corpus research designs, with an emphasis on the practical steps needed for researchers to understand and implement such designs. All three chapters offer insights into assumptions surrounding the quantitative/qualitative debate.

Chapter 3, by Sebastian M. Rasinger, introduces the most common principles in quantitative research – forming a hypothesis, and considering the quantifiability, reliability, and validity of data – and the most frequently used quantitative designs in linguistics. It then focuses on the use of questionnaires in quantitative research, offering many practical ideas on how to design, phrase and code questionnaires.

Chapter 4, by Erez Levon, complements the previous chapter by focusing on the nuts and bolts of the quantitative analysis of language, and particularly on how to construct and test hypotheses for such analysis. The chapter then examines in some detail two of the most common statistical tests used in linguistics: chi-square tests and t-tests. Finally, the author discusses the interpretation of quantitative results, and the issue of combining quantitative and qualitative methods in linguistic research.

Paul Baker then introduces corpus linguistics in Chapter 5. The chapter examines such issues as the theoretical principles surrounding corpus linguistics techniques, building and annotating a corpus, different types of corpora, and different kinds of research questions that may be addressed through corpus linguistics. Examples of applications of corpora are also given (from previous work in stylistics, discourse analysis, forensic linguistics and language teaching). The chapter finally demonstrates corpus analysis, providing examples of word frequencies, keywords, collocates and concordances.

The five chapters (Part III) that follow are concerned with qualitative methods in linguistics, representing a selection of current major methods: discourse-analytic approaches, linguistic ethnography, interviews and focus groups, multimodal analysis, and narrative analysis. While some of these can be seen as more general approaches and some as more specific data creation methods, in practice there is considerable overlap between the two, depending on the study. All five chapters adopt critical perspectives on each
topic, and make suggestions for new and emerging methodological pathways alongside the more established models. In addition, all chapters in this part of the book engage, to varying degrees, with recent debates about the relationship between the micro and macro levels of linguistic inquiry.

In Chapter 6, Judith Baxter reviews four discourse-analytic approaches to text and talk of particular value for current research in linguistics: Conversation Analysis, Discourse Analysis, Critical Discourse Analysis and Feminist Post-structuralist Discourse Analysis. The chapter outlines the background, basic principles, features and contributions of each approach. It also problematizes the relationship between the micro and macro levels of analysis, as this is conceptualized in each approach.

Chapter 7, by Angela Creese, describes linguistic ethnography and its methodological and analytical contribution to the study of language. It covers such issues as interdisciplinarity and theoretical diversity, the benefits of combining different types of data, and the role of fieldnotes and team ethnography in linguistic ethnographic accounts. It also illustrates how linguistic ethnography can be combined with other methods to produce rich data.

In Chapter 8, Nigel Edley and Lia Litosselli critically examine the use of interviews and focus groups within social science and linguistics research. The authors first discuss the criticisms levelled against these methods, and argue that it is problematic to use them as a tool for getting to people’s ‘true’ or ‘real’ views. Rather, they emphasize the role of interviews and focus groups as collaborative or interactional events that are context-specific and shaped as much by the interviewer as by those being interviewed. The chapter ends with a critical review of the primary strengths and weaknesses of these methods.

Chapter 9, by Jeff Bezemer and Carey Jewitt, deals with multimodal analysis and its relevance for the study of language and communication. It explores the theoretical and methodological implications of the different modes that people use to make meaning beyond language, such as speech, gesture, gaze, image and writing. The authors first discuss the role of multimodality in social linguistic research. They then focus on a social semiotic approach to multimodality, which they illustrate with examples from classroom interaction and textbooks. The chapter ends with a discussion of the potentials and constraints of multimodal analysis.

Finally, in Chapter 10, Julio C. Gimenez introduces the key elements of traditional and new emerging sociolinguistic approaches to the analysis of narratives. In terms of the former, he briefly discusses the key features of componential and functional analyses, by drawing on various examples of narratives. In terms of the latter, he presents a narrative networks methodology, as developed in the author’s own work: its origins and theoretical principles, as well as a step-by-step procedure for designing and analysing narrative networks.

I would like to thank the authors in this volume for their constructive discussions during the different writing, reviewing and editing stages of this book. I truly hope this book will encourage readers to reflect on the relationships between different research paradigms. I also hope it will encourage them to explore new possibilities for interaction and cross-fertilization among them.

References

Research Questions in Linguistics
Jane Sunderland

Chapter outline
This chapter takes as given that research questions, appropriately designed and worded, are the key to any good empirical research project. Starting with why we need research questions (as opposed to topics or even hypotheses), I explore where they might come from, and propose different types of research questions. Research questions of course need to be operationalized, and the chapter explores the implications of different types of research questions for data, data collection and analysis. Equally importantly, research questions need to be explicitly documented, in terms inter alia of their origin, rationale and implementation, and the chapter looks at how (and where) this might be done. Research questions are discussed throughout with a specific eye on linguistic studies, exemplified using linguistic research, and there is a focus on linguistic data and analysis.

[Research questions] are vehicles that you will rely upon to move you from your broad research interest to your specific research focus and project, and therefore their importance cannot be overstated
(Mason, 2002: 20)

1.1 Why do we need research questions?
Research questions are, I argue, the key to any empirical research project. Without research questions, you will flounder; with them, you will be guided in terms of data needed, data collection methods and data analysis. Ask yourself, 'What data do I need?' The answer is 'That which best enables me to
answer my research question(s) ‘How do I analyse it?’ ‘In a way which allows me to address my research question(s)’ And so on. This is because a piece of empirical research is normally designed to address one or more research questions – the answers to which should constitute a contribution to knowledge.

In the social sciences, empirical research very often employs explicit research questions. If you are about to conduct empirical research, first ask yourself, ‘What am I trying to find out in my research project?’ If you can answer this, you have the basis for a research question.

Many of us go into a research project with our ideas in general, and our research questions in particular, rather broadly formulated. Alternatively, our research questions may be precisely formulated, but, we may discover, erroneous (not amenable to investigation, or otherwise inappropriate). At the start of a project, neither may be too much of a problem, because a research question should not straightjacket you. Rather, you can see it as an initial direction – like a compass point, whose needle is swinging. Further down the line, you may find that issues come up which are interesting and relevant but which do not address your research question(s), that is, which answer questions you have not asked. If these do not require new data, you may wish to consider adding a new research question. At some point, however, your research questions need to stabilize (although there is room for getting their wording accurate right up until the end of the research project).

You may be used to the term hypothesis rather than research question. Hypotheses are more characteristic of the natural than the social sciences. While hypotheses and research questions are related, hypotheses tend to be more precise. A hypothesis is conventionally worded as a statement, which is to be investigated and proved or disproved through empirical study. An example would be ‘In terms of school library use, boys in Year 6 of UK Primary Schools borrow (a) more works of non-fiction than fiction, and (b) more works of non-fiction than do girls.’ Hypotheses are also perhaps more characteristic of quantitative than qualitative research (see Chapter 3). Research questions, accordingly, are characteristic of qualitative research, and are likely to be both broader and more exploratory than hypotheses, for example, ‘What are the borrowing practices of UK Primary School Year 6 girls and boys in terms of fiction and non-fiction?’

A set of research questions should be formulated in ways which allow the identification and investigation of further issues that only doing the research can bring to light (i.e. that could not have been included in a hypothesis). In her own research questions checklist, Jennifer Mason (2002: 19) includes the following: ‘Are they open enough to allow for the degree of exploratory enquiry I require? Will they allow me to generate further questions at a later stage, in the light of my developing data analysis, should I wish?’ (see also Andrews, 2003) Of course, a set of research questions should not be too general, vague or multidimensional, and below I show how these pitfalls can be avoided through the use of different types, sequences, combinations and hierarchies.

1.2 Where do research questions come from?

One broad answer to this question is ‘the literature’. In the process of reading and of writing a literature review around your topic:

- you may come across a suggestion for an (unanswered) research question; however, do check that it has not, in fact, been addressed, and, indeed, that as a question it is both worthy of investigation (is it still interesting and original?) and operationalizable (see below)
- you may decide to replicate someone else’s work, perhaps to challenge it, perhaps within a different or particularly interesting context, or perhaps to use a different form of analysis on the same or related data
- you may identify a ‘niche’ in the research literature, that is, something related to your topic has been asked, but something else has not

The advantages of arriving at research questions through a literature review are, as Andrews (2003: 17–18) points out, ‘that the question(s) will be well-grounded in existing research (assuming the literature review is a good one); there will be a coherence between the literature review and the rest of the thesis (again assuming the rest of the thesis is driven by the questions).’

A second broad answer is ‘a pre-existing topic’ (which then drives the literature review). For example:

- you may have identified a recent and unpredictable political, social or natural event which sheds light on our understanding of a particular social concept; for example, Hurricane Katrina in the United States or the Summer 2007 floods in the United Kingdom might provide ‘sites’ for studying the sociolinguistic/ethnographic notion of ‘Community of Practice’, or the 2008 American Presidential elections a site of ‘modern political rhetoric’
• you may have identified an interesting linguistic phenomenon or development (e.g. use of the phrase what's with ... to enquire about something unusual; blogs would be another relatively recent example, illustrating the affordances of a particular medium and a new form of communication)

A third possible source of a research question, more controversially, is that it comes out of your own findings. Your data may suggest answers to research questions that you didn't ask; hopefully you will be able to ask them now, of that data — as long as this does not destabilize, divert or unacceptably increase the workload of your entire research project. If it can be addressed without dilution or compromise, then there is no reason why a new research question cannot be introduced, and its genesis incorporated into the 'story' of the research project in question.

We can also consider the possibility of some data being 'hypothesis-generating' and some 'hypothesis-testing' (a distinction introduced by Allwright (1983), in which 'hypothesis' can be replaced by 'research question'; see also Salhani-Nodoushan (n.d.)). Diary studies, for example, may be 'hypothesis-generating' (let us imagine a group of students writing about their experience with a new language), in that the preoccupations documented in the diaries may suggest/generate research questions (e.g. 'What is likely to cause anxiety in novice learners of a foreign language?' — see Schumann and Schumann, 1977). These research questions can then be 'tested', or at least empirically addressed (e.g. 'Does reading or listening to words in a new language constitute a greater source of anxiety for novice learners of a foreign language?').

### 1.3 Research questions, topics and puzzles

When asked what their research question is (e.g. on their Ph.D proposal form), it's surprising how many novice researchers actually provide a topic. In the area of language education, your topic might be, say, 'Teacher beliefs', in particular 'the beliefs of UK primary school teachers about foreign language teaching and acquisition'; or 'Language testing', in particular 'testing foreign language use in genuinely communicative situations'. A research question however is a question, and should be worded as an interrogative (see below). It is not a topic, although it grows out of a topic.

Alternatively, some people might consider an *intellectual puzzle* as a basis for their research, for example, 'Why is it that foreign language teachers tend to see girls as almost automatically better language learners than boys?' (see Allwright, 2003; Mason, 2002, for more on intellectual puzzles). Here, you may be drawing on your own experience and (informed) hunches. For example, as a teacher, you might feel that exercises from a certain textbook almost always go down better with the students than exercises from a different textbook, and you are curious to find out why (addressing such puzzles has been conceptualized by Dick Allwright as 'Exploratory Practice' (http://www.prodait.org/approaches/exploratory/)). The answer to this particular research question would have implications for classroom texts and pedagogy beyond the particular teaching situation.

Both topics and puzzles need 'translating' into appropriate research questions, that is, though careful formal expression, including in terms of accurate, appropriate and productive interrogative wording. But to look at wording, we also need to look at types of research questions

### 1.4 Types of research questions

To illustrate some possible 'types' of research questions, let us take the topic of 'beliefs of UK primary school teachers about foreign language teaching and acquisition'. Within this, your research question(s) might be one (or more) of the following:

- Do French teachers working in UK primary schools agree with the teaching of French to Year 6 primary school children?
- What reasons do French teachers working in UK primary schools give for including the teaching of French to Year 6 children in the curriculum?
- What reasons do French teachers working in UK primary schools give against the teaching of French to Year 6 primary school children?
- How do UK primary school teachers of French believe Year 6 children best learn French?
- What is the range and diversity of beliefs of UK primary school teachers of French in relation to the teaching of French to Year 6 children?
- Why do UK primary school teachers of French hold these beliefs?

Note that these research questions are formulated as *interrogatives*: *Do, What, How, Why* Other research questions might start with *Is/Are, When,.*
Where, Who or To what extent? These interrogatives suggest different sorts of research questions: whereas How, When, Where, What, Is/Are, Do/Does and To what extent may be descriptive, Why is clearly explanatory.

You need to consider carefully what you want to ask (often more than one question), and the sequence: it may not be possible to answer one research question without having answered a previous one. For example, in many research projects, research question 1 is descriptive (Does . . . ?) and research question 2 explanatory (Why does . . . ?) (I return to the question of explanatory research questions below.)

Novice researchers often wish to address an ‘evaluative’ research question, such as ‘What is the best method of teaching listening in [context X]?’ or ‘Should EFL teachers be discouraged from using the students’ L1 in [context X]?’ The difficulty with such research questions, aside from the problem of ‘operationalizing’ them (see below), is that they tend to entail something like ‘According to who/what or ‘If Y is to be achieved . . .’, or even a particular desideratum (see Litosseliti, 2003). My feeling is that evaluations, coming out of the findings of descriptive research questions, are best expressed in the form of recommendations (or implications), perhaps in a Discussion section or chapter. For example, the question ‘What is the best method of teaching listening in [context X]?’ might be addressed not through a research question per se but rather through a discussion of findings of research questions such as (a) ‘What different methods of teaching listening are employed in [context X]?’; (b) ‘What are teachers’ and students’ views?’ and (c) ‘Is there any correlation between method and test results, here?’ Recommendations however still need to be expressed with caution, in part because of the problem of establishing causality (e.g. between use of a new method of listening and improved results in a listening test), and the issue of test validity (i.e. here, of that listening test).

In addition to a categorization of research questions as descriptive, explanatory or evaluative, cutting the research cake in other ways allows still other distinctions to be made, and referred to explicitly in the dissertation or thesis. These include the following:

Primary/secondary Quite simply, some research questions might be more important than others, in terms of the focus of the study, or simply the quality and/or quantity of data collected, selected or elicited to address a given research question.

Main/contributory It may not be possible to answer your main research question until an earlier (‘contributory’) research question has been answered.

For example, a contributory research question such as ‘Does X happen . . .?’ allows two further (alternative) main research questions to be addressed, for example: ‘If X happens, why might this be . . .?’ and ‘If X does not happen, why might this be . . .?’ (see also Andrews, 2003).

Overarching/subordinate Two or more research questions might be grouped hierarchically under a ‘higher’ one, which together they address; for example,

- Overarching research question: What are some differences in the way [a given political event] is reported in newspaper X and newspaper Y?
- Subordinate research question 1: How are the ‘social actors’ in each newspaper report normalized?
- Subordinate research question 2: Which report uses the greatest proportion of agentless passive verb constructions?

The ‘overarching’ question cannot be ‘operationalized’ (see below) as it stands, but can be operationalized through the two subordinate research questions.

Empirical/methodological/theoretical While your research questions will probably be largely aimed at producing empirical findings (concerning, for example, part of the language system, an aspect of language use, language learning/teaching), you may also be interested in the investigative (methodological) process itself. An example of a methodological research question might be ‘Are fieldnotes made by the researcher an effective way to investigate code-switching in workplace talk by migrant hotel workers?’ and a second: ‘What might effectiveness depend on, here?’ Another possibility might be ‘Can Critical Discourse Analysis (CDA) be usefully applied to the talk of preschool children?’ Don’t feel that you must have a methodological research question. However, if you are doing something innovative or otherwise interesting methodologically – for example, combining two approaches which are not usually combined – this could constitute an ‘intellectual contribution’ of your study. If so, it may be worth ‘promoting’ this aspect of your methodology to the status of a research question.

Theoretical research questions are likely to refer both to theoretical concepts and their deployment in empirical research. Andrews’ (2003: 23) illustration of a theoretical research question is: ‘What is a theoretical framework within which Hong Kong children’s writing [in English] can be analysed and described?’, though he does not label this as such.
Of course, almost all research questions are researcher-generated. But this begs the question of the role of your research participants (assuming you are not doing text-based research). Are you, as Cameron et al. (1992) pointedly ask, doing research on, with or for your participants? Relatedly, Cohen et al. (2007: 88) propose that the researcher asks not only ‘What are the research questions?’ but also ‘Who decides what the questions will be?’ and ‘Can participants add their own questions?’ Someone doing research for their MA dissertation or Ph.D. thesis may have less space to explore the possibility of ‘research for’ participants than a researcher who has received a grant to do exactly that. However, MA or Ph.D. researchers are often not accountable to a grant-awarding body, and this may be precisely the time when they can consider how to work with research participants, and perhaps how to address those participants’ own concerns.

Some research questions – the Why questions above, for example – may need to be speculative, rather than empirical, perhaps informed by the ‘answers’ to empirical questions (in combination with your own professional or other insights).

As the above set of distinctions suggests, your research questions can and should constitute a coherent whole, that is, be explicitly related to each other. Both sequence and hierarchy are important here. Most obvious, as suggested, might be two research questions, the first (research question 1) being descriptive (e.g. “To what extent . . . ?”), the second (research question 2) explanatory (“Why . . . ?”). Alternatively, as shown, an overarching question (research question 1), may not itself be operationalizable, but may be operationalized via two or more subordinate research questions (research question 1a, research question 1b). The relationship between the research questions should be clear, to allow a reader to see what it is you are trying to do in your research project. But this sort of organization is also important for you. Once you have created this coherent structure, you will be able to see if some of your research questions are basically the same (and hence should probably be combined), or if one is in fact a sub-research question of another. Andrews makes the useful suggestion here of writing each research question on a separate strip of paper and organizing them accordingly:

Experiment with moving the questions so that they seem to make sense in relation to each other. Does one of them seem like the main question? Are some more general or more specific than others? How do they stand in relation to each other? Can some of them be omitted, or fused, or added to?

(Andrews, 2003: 39)

Two final points about the wording of research questions. First – every ‘content’ word in a research question matters. To operationalize your research question, you will need to know exactly what each word is to mean as far as your research project is concerned (a ‘working definition’, that is, ‘for the purpose of this dissertation/thesis’). Secondly, and more generally, Mason (2002: 19) reminds us that we should ask of our research questions, ‘Would anyone but me understand them?’ It is crucial that the answer is ‘Yes’ – especially if aspects of your study are to be replicable. If others cannot understand your research questions, it is worth considering whether they are, in fact, formulated in a way which is clear enough for you to address them properly.

1.5 How many research questions?

This question, inevitable after considering the wide range of types of research question, is, however, like asking about the length of the proverbial piece of string. Broadly, most research projects use more than one research question, often of different types. Mason (2002: 21) notes, ‘In the early stages, it can be helpful to generate a lot of research questions.’ Ultimately, however, the rule of thumb is to ask only as many research questions as can satisfactorily be addressed. The issue is not the number of research questions, but what is needed (in terms of data, analysis, time and effort) to answer a given research question, that is, the scale of a given project. Some questions are bigger than others. Andrews (2003: 4) cites ‘What is the impact of communication technologies on learning worldwide?’ as an unanswerable research question due to its level of generality; other research questions may be unanswerable (especially in postgraduate research) because they require a lengthy longitudinal study (e.g. data collection over five years), or more interviews than the researcher could conduct and analyse. In Mason’s (2002: 21) words, ‘you will quickly need to focus to ensure that you are designing a manageable project.’

It may be necessary to ‘sacrifice’ a research question if it cannot be done justice to (see, for example, Sunderland, 1996a). Painful though this may be, it may ensure that you avoid producing a superficial and diluted piece of work – remind yourself that sacrificing a research question and all that goes with it often strengthens the study and provides material for a later piece of work (a publication in-the-making). In my own Ph.D. thesis, on classroom interaction, I originally included research questions on wait-time (e.g. the amount
of time a teacher gives a student to answer a question before answering it him/herself and interruption. I abandoned the wait-time question because it would have required special timing equipment, and the interruption question because of its conceptual complexity (which I could not have embraced within the scope of my thesis). These sacrifices entailed a sense of loss but enabled me to address the remaining research questions more fully.

1.6 Research questions and linguistic data

You may have noticed that the research questions in section 1.4 on 'Types of Research Questions', despite being concerned with language education, could largely be addressed through data in which language itself was not to be analysed. In much linguistic and applied linguistic study, however, the majority of research questions will include a linguistic component. (Indeed, it is arguable that many research projects outside linguistics would benefit from at least one research question which is concerned with language – something that is actually happening, given the 'discursive turn' across the arts, humanities and social sciences (e.g. Billig, 2001).

Let us consider a set of research questions from a research project in the field of sociolinguistics:

1. Is the quotative use of *be like* in talk (e.g. *He was like 'I can't stay here'* ) on the increase in British English?
2. To what extent (if any) does the quotative use of *be like* in British English vary with age?
3. Is the quotative use of *be like* a greater marker of male or of female adolescent speech in the United Kingdom?

The focus of all three of these research questions is language use. (This clearly guides the data needed, data collection methods, and data analysis – see below.)

However, language can be a focus not only in terms of occurrence, but also perceptions. Other research questions on the topic of the quotative use of *be like* might be

4. Is the quotative use of *be like* in talk in English perceived as gendered by users?
5. If yes, how?
6. If yes, why?

Research questions about language *use* and about *perceptions* of language use are both valid in sociolinguistics, and indeed complimentary in our understanding of particular linguistic phenomena.

A research study can also include linguistically oriented research questions to do with a specific linguistic code or use of that code. When I wrote my own Ph.D thesis (Sunderland, 1996a) on gender and teacher-student interaction in the foreign language classroom, work had already been done on interaction and gender in classrooms, including a little in second/foreign language classrooms, but there was (to my knowledge, to date) no work on gender and interaction with regard to the foreign language classroom *as such*. This meant that I could ask research questions which had been asked of other classrooms but had not apparently been asked of foreign language classrooms. I could then consider the *special characteristics* of the foreign language classroom: in particular, that two languages (at least) would normally be in use there. This pointed to a need to design a range of research questions focusing on the 'codes' used in this foreign language classroom (the relevant languages were the students' L1, English, and the target language, German).

My empirical research questions asked about teacher talk and student talk. In terms of teacher talk, the overarching research question was

- Does the teacher use more or different language to/about boys and to/about girls?

The subordinate research questions were concerned with (a) teacher solicits (i.e. language used with the intention to someone to do or say something), (b) teacher feedback to students' spoken answers to her question, (c) teacher comments and (d) teacher responses to student solicits. The list of subordinate research questions was long, and I include just seven (!) of them here as illustration:

1. How many male or female students are named (or otherwise identified) in the context of a solicit?
2. How many words of a solicit are directed to a particular student?
3. How many solicits are non-academic, how many academic?
4. Of the academic solicits, does the teacher direct more solicits to girls or to boys in either German, English or both?
5. As regards the answer to the academic solicits:
   (a) does the intended language of response vary with sex of addressee?
Cont'd

(b) does the intended type of response (predetermined or 'pseudo-open') vary with sex of addressee?
(c) does the intended length of response (one word or potentially longer) vary with sex of addressee?
(d) Does the teacher provide different types of feedback to girls' and boys' broadly 'correct' answers to her academic solicits?
(e) Does the teacher provide different types of feedback to girls' and boys' broadly 'incorrect' responses, or lack of responses, to her academic solicits?

Of the above research questions, though all were concerned with language in the sense of 'teacher talk', research questions 4 and 5a (in bold) were also concerned with use of a particular linguistic code: here, German or English. As all the questions were original in that they had not been asked before in the language classroom (most had not been asked of any classroom), I saw this particular focus on gendered use of linguistic code in the classroom as one of the 'intellectual contributions' of my thesis.

1.7 Operationalizing research questions

For an empirical research question (the sort you can only answer through data) to be operationalizable (see also Cohen et al., 2007: 81–3), there must be a way of addressing it, in terms of identifying the appropriate data, collecting and analysing it (see section 1.8). Often there are indications of how to do this in the research question itself. For example, as we have seen, a research question like 'What reasons do French teachers working in UK primary schools give for the teaching of French to Year 6 primary school children?' suggests that the researcher would elicit data, for example, might ask teachers a set of interview (or questionnaire) questions which together, properly analysed, would address this research question. Note though that the words 'What reasons do [they] give . . .?' constitute an important reminder that we cannot get at people's actual reasons directly from what they say – at best, these are 'reported beliefs', the beliefs they 'give' (see also Chapter 8). This has implications for the interpretation of findings and the strength of claims that can be made. (Note that interview questions are not the same as research questions. It would be unreasonable to put your research question directly to a respondent.)

Also important in operationalization is defining key terms. For the set of research questions given earlier about the 'quotative use of be like', we would need to be clear about what we mean by this. It may seem obvious (as in the example in the research question itself, He was like 'I can't stay here'), but there may be cases where it is not clear whether be like is quotative or not, and parameters will need to be drawn. Also in need of a working definition (i.e. a definition 'for the purpose of this study') is the concept, in these research questions, of adolescence (who counts as an adolescent?). Of course, the terms in your questions will correspond to your theoretical and epistemological focus: this is very evident in words like ideology or discourse, but even the word beliefs in a research question indicates that you consider your research participants' understandings as important, interesting and epistemologically valid in a given research endeavour (see also Mason, 2002).

1.8 Implications of your research questions for data, data collection and analysis

Mason points out that your research questions should be clearly formulated, intellectually worthwhile, and researchable (because it is through them that you will be connecting what it is that you wish to research with how you are going to go about researching it') (2002: 19). I have already pointed to the role of research questions in identifying appropriate data and accordingly data collection, elicitation (generation), or selection (e.g. when looking at a body of literary or newspaper texts). Of course, you also need to be sure that you can get the relevant data, and can get enough of it.

One example of a research question with clear methodological implications (for data collection, and research design more widely) is Nunan's (1992):

- Are authentic materials more effective in bringing about learning than materials written specifically for the language classroom?

In that this research question is comparative, addressing it would entail researcher intervention. The research project would require an experimental set-up, with materials (authentic/written specifically for the language classroom) as the independent variable, and 'effectiveness in bringing about learning' as
the dependent variable. Both ‘authentic’ and ‘effectiveness in bringing about learning’ would need to be defined. Of course, the teaching and learning conditions would need to be controlled as far as possible, so that the materials were used by students of similar levels and abilities, who would ideally be taught by the same teacher.

Let us take an example of a research question and work it through: ‘How do white female British university students construct their femininity in informal situations in talk with their same-sex peers?’ Our data might be transcripts of naturally occurring talk of such students in informal situations (Note that if we elicited data, for example, through interviews, we would be answering a question about how these students understand or report their construction of femininity). To collect this data, we would need to identify an ‘informal situation’ and then do some audio and/or video recording, either including participant observation (which might distort the data, and would indeed make the event less ‘naturally occurring’), or recording without the researcher present, perhaps asking the students to wear radio-microphones and giving them control of the recording equipment. Alternatively, we might identify and use a corpus of spoken British English which included conversations between white female British university students. In terms of preparing the data for analysis, we would need to carefully consider how to transcribe the recorded data. This is not a mechanical procedure: on the contrary, again, it depends on the research questions. Let us say, for example, that we were interested in the role of overlapping speech in the construction of femininity, perhaps as a measure of articulated empathy and/or support (see Coates, 1996). In this case we would have to make an active decision to indicate overlapping speech on the transcript, and further to decide (and document) how to do this.

As regards analysis, your research questions and data are likely to suggest a particular approach or framework related to the theoretical underpinnings of your work. For this example, we would probably decide on some form of discourse analysis (see Chapter 6), say, Conversation Analysis (CA) (Hutchby and Wooffitt, 2001), Critical Discourse Analysis (CDA) (Fairclough, 2001), Feminist Post-structuralist Discourse Analysis (FPDA) (Baxter, 2003), or perhaps a combination. Analysis is not however a self-evident or straightforward procedure based on, say, a decision to do with efficiency, but more to do with what we might call ‘ontological alignment’. For example, not all researchers self-identify as feminist; and opposition to both CDA and CA can be ideological, based on views about the appropriate stance and role of the analyst. What is likely is that your idea of your theoretical/analytical approach will in fact inform your topic and indeed your research questions, so that when you come to analyse your data, your analytical framework is, if not exactly ‘waiting for you’, a ‘rational’ decision which is theoretically consistent with your entire research project. If you are interested in language, power and ideology – and accordingly in CDA – your topic and research question(s) are likely to reflect this (you might be investigating the ‘legitimation’ of racism in talk, for example, or verbal dominance of one group over another in a public meeting), and you are likely to wish to analyse your data through one of the several versions of CDA (see Wodak and Chilton, 2005).

Let us now return to two of the language education research questions referred to earlier in this chapter:

- Do French teachers working in UK primary schools agree with the teaching of French to Year 6 primary school children?
- What reasons do French teachers working in UK primary schools give for including the teaching of French to Year 6 children in the curriculum?

and research questions 4 and 5 (above) about be like:

4 Is the quotative use of be like in talk in English perceived as gendered by users?
5 If yes, how?

For these research questions, you would need to elicit data, since you are dealing with (reported) attitudes, reasons, beliefs and perceptions. You could record people’s naturally occurring talk, hoping that they would express their understandings of these very topics – but you might wait for a very long time. You would therefore probably consider using questionnaires or individual or group interviews (see Chapter 8).

In contrast, for research question 1 about the quotative be like

1 Is the quotative use of be like in talk (e.g. He was like ‘I can’t stay here’) on the increase in British English?

you would need a corpus of spoken English (with talk collected more and less recently), as this research question is about change, in actual language use, over time. And for the second be like research question:

2 To what extent (if any) does the quotative use of be like in British English vary with age?
you might, in addition to corpus data, use naturally occurring data, that is, samples from speakers of different ages.

Some research questions can be answered from existing data. Look again at the fifth language education research question (p. 13)

- What is the range and diversity of beliefs of UK primary school teachers of French in relation to the teaching of French to Year 6 children?

Here, the researcher needs to identify the range and diversity of beliefs from the total set of those s/he has already identified. This is important: a research question does not necessarily require its own specific dataset.

Finally, let's revisit the last 'language education' research question, and research question 6 about quotative *be like*.

- Why do UK primary school teachers of French hold these beliefs?
- If yes, why is the quotative use of *be like* in talk perceived as gendered by users?

These research questions are more difficult to address. In the social sciences, it is almost impossible to answer a 'Why' question in a way which is completely satisfactory. I have already mentioned the problem of establishing causality (as opposed to association). Of course, even without any data from the questions preceding each of these two research questions, it is possible (and may be instructive) to speculate about many possible answers. But even with data, a variety of explanations (answers to 'Why?') will suggest themselves, constituting what can be called 'competing hypotheses' (Dick Allwright, personal communication). And even if we ask teachers 'Why do you hold these beliefs about teaching French to Year 6 primary school children?', we cannot see the teachers' answers as 'truth' or 'facts'. While interview respondents may not be deliberately deceiving the researcher, or deceiving themselves, their responses are nevertheless 'co-constructions': jointly co-constructed with the interviewer, within the interview process itself (see Chapter 8). Put simply, a respondent might pick up on the words of the interviewer, might tell the interviewer what s/he thinks the interviewer wants to hear, or might construct an answer newly suggested to her/him by the interview prompt (see Litosselli, 2003, for a discussion of types of prompts and questions typically used in focus groups). 'Why' questions thus have to be handled with a great deal of caution, and 'answers' expressed in a way which is neither overstated nor reductionist. For this reason, the (very important) question of 'why' is often addressed in the discussion of findings, rather than asked through a research question 'at the outset'.

### 1.9 Documenting your decisions in your article, dissertation or thesis

The many decisions described above are not a 'private' or implicit matter. When writing an MA dissertation or Ph.D. thesis, it is most important to document all your decisions, and reasons for them. Helpful here is to start by summarizing your methodology in a table such as this:

<table>
<thead>
<tr>
<th>Research Question</th>
<th>Data needed</th>
<th>Data collection</th>
<th>Data analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
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<td>2</td>
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<tr>
<td>3</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

Such a table will help you organize your thinking and documenting of decisions; it will also help those all-important readers of your thesis or dissertation. Things are, however, rarely quite so cut and dried. For example, one research question might require two sources of data; conversely, as suggested above, one source of data might address more than one research question – and therefore your table will need adapting. But if you find that you have an empirical research question lacking data with which to address it, or data with no corresponding research question, then you have a useful alert to the fact that you need to reconsider your research design.

Documenting your decisions around your research questions however goes beyond justifying their operationalization through associated data, data collection methods and analytical framework. You also need to show that the research questions themselves have not 'fallen from the sky'; each needs a rationale (see section 1.2 'Where do research questions come from?'). This is related to originality and your own 'contribution to knowledge'. It is worth indicating in what sense each of your research questions is original – for example, has it ever been asked? or has it perhaps been asked before, but of a different context? For example, while most of my own Ph.D. research questions had not, to my knowledge, been asked before, others had – but of a classroom other than a foreign language classroom.
Equally importantly, research questions can (indeed, should) be referred to throughout the work - especially if different parts of the study address different research questions. In terms of data collection, different data will probably be collected with different research questions in mind. And all the research questions should almost certainly be referred to in the discussion: not so much in terms of you having 'answered' each research question, but, having addressed it, discussing it, and identifying the implications of what has been found. Continuous reference to your research questions (e.g. in each analytical chapter, to those research questions you are addressing there) will not only help you stay on track and organize your thesis as a whole; it will also help the reader appreciate the reasons for what you are writing at all times.

Notes
1 Note also that these particular Is/Are/Do/Does questions 'expect' more than a Yes/No answer!
2 I am grateful to Kate Harrington (2006) for this example of a research topic
3 I would not now necessarily employ (or recommend) a long list of subordinate research questions.
   Proper operationalization of an overarching research question should not result in what Cohen et al. call an unwieldy list of sub-questions' (2007: 89)
4 In many cases the differences were non-existent or statistically insignificant (by no means disappointing). In particular, girls and boys had an approximately equal chance of being asked a solicit by the teacher in either German or English. Findings of gender-differential tendencies related to linguistic code included that (a) girls were asked a greater proportion of academic solicit to which they were expected to respond in German than were boys (near statistical significance at 5% level), and (b) girls volunteered more answers than boys in German (statistically significant at 5% level) and English (non-significant).

Further reading
Andrews (2003) - A useful book for different levels of students in Higher Education whose research has a social or (language) education focus. Using several actual case studies, Andrews looks at the genesis and types of research questions and methodological implications, as well as problems researchers may encounter.

Cameron, Frazer, Harvey, Rampton and Richardson (1992) - A thought-provoking book, which looks at the questions of research 'on' for 'or' with participants, and, implicitly, at where the research questions for a given study come from.

Cohen, Manion and Morrison (2007) - An extremely substantial and comprehensive 'classic' work, which is relevant to research both within and outside education. Make sure you get the latest edition (currently sixth) 'Research questions' are covered in chapter 3.

References
Chapter outline

The twofold purpose of this chapter is to problematize the widely held quantitative versus qualitative research dichotomy, and to address the issue of integrating the two paradigms in research projects in linguistics. While there is an increasing body of research placing value in mixed methodologies, recent work has also indicated potential barriers and limitations in viewing the 'third paradigm' as a necessary alternative. Following Tashakkori and Creswell's (2007) recent overview of the conceptual and epistemological challenges in mixed methods research, one of the key issues I focus on here is the ongoing discussion on the amount of integration of the quantitative and qualitative elements in research designs. The chapter draws on studies that have used a wide range of methodologies and discusses the merits as well as the challenges in combining paradigms but also methodologies and methods. By way of illustration, attention is paid to research in the broadly defined area of workplace discourse. I discuss the ways in which mixed methods designs can contribute to the dissemination of findings and the applicability of such research, as well as help overcome specific challenges involved in conducting research in this area.

2.1 Introduction

Projects in the field of linguistics often subscribe to either the quantitative or qualitative paradigm even though a closer examination would indicate that a large number of these studies fall somewhere between the two ends of the continuum (Miles and Huberman, 1994). The benefits of combining the two paradigms have been repeatedly discussed in the social sciences/humanities...
research methodology literature (e.g. Creswell, 1994). In fact, there is a lot of work in the (applied and socio) linguistic field on the value of combining either direct or indirect data gathering methods (e.g. Harrington et al., 2008; Litosseliti, 2003) or applying diverse techniques for data analysis. In a seminal early work, Greene et al. (1989) reviewed studies taking a mixed methods approach and argued that combining the two paradigms is beneficial for constructing comprehensive accounts and providing answers to a wider range of research questions. In the same vein, Tashakkori and Teddlie (2003) in their recent work suggest that mixed methods, often operationalized as almost a synonym for collecting different datasets or applying more than one method for the data analysis, provide ‘ways to answer research questions that could not be answered in any other way’ (2003: x). And research in sociolinguistics has shown that combined methodologies can shed light on ‘different layers of meaning’ (Holmes, 2007: 5). For example, Stubbe et al.’s (2003) work has shown the benefits of applying a wide range of analytic approaches, traditionally with methodologically distinct boundaries, to workplace discourse. At the same time there has been a shift towards multidisciplinary research (e.g. Brannen, 2005) as more and more researchers undertake joint projects bringing together fields of study and subsequently the methodologies that are often associated with these fields.

It is still quite commonplace, however, for the two paradigms to be directly contrasted. As Green and Preston recently suggested in the editorial of a special issue devoted to mixed methods research, ‘the image of the introverted statistician . . . or the hang-loose ethnographer are by no means eliminated’ (2005: 167). They also referred to the paradigm war of the 1970s and 1980s (Tashakkori and Teddlie, 2003), where the ontological and epistemological differences of the quantitative and qualitative approaches to research were foregrounded and sharply contrasted. Following a strong and long held tradition of paradigm incompatibility, this quote also nicely encapsulates the stereotypes that have been associated with researchers aligning their work with the quantitative and qualitative paradigm respectively.

Against this backdrop, and in line with Dörnyei (2007), the stance I take here is that this juxtaposition of the paradigms may point to the researchers’ (diverse styles and) world-views rather than the mutual exclusiveness of the two approaches. Further, I adopt a pragmatist’s stance, according to which methodologies represent a collection of techniques (Bryman, 2001; Rossman and Wilson, 1983) as opposed to a purist’s stance, which would see qualitative and quantitative methods as being incompatible. I do not aspire to exhaust the discussion on the merits and challenges of mixed methods here. My aim however is to problematize both a range of issues relevant to aligning a research project to a specific paradigm, and the practicalities that may affect research designs, the collection and interpretation of data and dissemination of findings. I discuss the notions of ‘integrating’ and ‘mixing’ both at the level of overarching paradigms (namely mixed methods, qualitative and quantitative) but also at the level of specific methodologies associated with fields of study. In order to illustrate these issues I draw on studies in the field of business discourse.

This chapter is organized into four parts. In order: to place the discussion in context, a brief overview of current issues in mixed methodologies is provided. I next move on to the thorny issue of triangulation and the way it is frequently used by researchers. I then discuss studies in the broadly defined field of workplace discourse, paying special attention to the relationship between mixed methodologies and applicability of research. I finally turn to the implications and conclusions that can be drawn.

2.2 Qualitative, quantitative, mixed and multimethod designs

As Seliger and Shohamy (1989; DeVaus, 2002), among many others, suggest, the research methods and techniques adopted in any research project depend upon the questions and the focus of the researcher. However, this may suggest a rather ‘instrumental’ stance which does not always capture the philosophical and conceptual underpinning as well as theoretical debates and complexities of the ‘approach’ researchers choose, thus reducing it to ‘what works’ (Sunderland and Litosseliti, 2008; Tashakkori and Teddlie, 2003). Even though the unassailability deriving from a ‘what works’ position is rather straightforward, the extent to which it is relevant to the mixed methods paradigm is debatable. In fact, over the last few years an increasing volume of work has appeared (e.g. Bryman, 2006; Johnson and Onwuegbuzie, 2004) which illustrates (a) the conceptual decisions researchers make in choosing a particular design within this paradigm, and (b) the robustness of the paradigm itself. In addition, there is great variety in mixed methods designs; Tashakkori and Teddlie (2003) have identified over 40 types of designs within their recent handbook. Hence mixed methods ‘is not to be mistaken for an “anything goes disposition”,’ (Dörnyei, 2007: 166) and should not be seen as an unstructured ‘fusion’ of quantitative and qualitative research or as just the additive ‘sum’ of both paradigms.
Another important issue that is often discussed in association with mixed method research is the compatibility and transferability of various paradigms and methodologies, within and across different disciplinary and epistemological communities. While there is a growing consensus that combining approaches is not only feasible but also beneficial in revealing different aspects of ‘reality’ (Lazaraton, 2005: 219), there is an open question as to whether many methods and types of research would comfortably sit under the same design.

The question, then, is whether the two sorts of data and associated methods can be linked during study design, but whether it should be done, how it will be done, and for what purposes (Miles and Huberman, 1994: 41).

Within the linguistic field, Sunderland and litosseliti (2008) provide clear examples of how ‘affiliation’ to certain epistemological approaches may influence the approach taken and methodologies selected. In the case of discourse analysis, for instance, there are widely recognized approaches (including Conversation Analysis (CA), Interactional Sociolinguistics, Critical Discourse Analysis (CDA), Discursive Psychology, Interpretative Discourse Analysis, and Post-structuralist Discourse Analysis (PDA)), each with a recognizable associated set of methodological tools. These different approaches often stay somewhat insulated within specific disciplinary boundaries, each working with distinctive conceptions of discourse, as well as distinctive tools and processes (e.g. regarding the operationalization of the context of interactions for the interpretation of discourse data). A discussion of how approaches (and researchers taking a certain stance) do not always sit comfortably under one design can be found in Harrington et al. (2008); also many a reader will be familiar with the debate that was published in Discourse & Society (e.g. Schegloff, 1997) around the different theoretical assumptions made by CA and CDA researchers. It is beyond the scope of this chapter to consider potential barriers in reconciling different theoretical assumptions, however, the question on the extent to which quantitative and qualitative methodologies are compatible is relevant. A growing number of researchers have consistently argued for, and indeed, adopted approaches which attempt to integrate (emphasis mine) quantitative and qualitative methods of analysis. Using the patterns identified by the quantitative analysis as essential background to assist in the detailed qualitative interpretation of the discourse.

(Holmes and Meyerhoff, 2003: 15)

In the editorial of the Journal of Mixed Methods Research, Tashakkori and Creswell (2007) provide a useful overview of the conceptual and epistemological challenges in ‘bridging’ quantitative and qualitative research designs. While recently the mixed methods paradigm was defined as ‘the class of research where the researcher mixes or combines’ (Johnson and Onwuehuzie, 2004: 17) quantitative and qualitative elements, according to Bryman (2007) the key issue to be considered is the amount of ‘integration’ of the two paradigms; for instance, Gelykens (2008) suggests that most studies in his subfield of cross-cultural pragmatics combine rather than integrate research methods. A growing number of works distinguish between combination/integration.

I follow here Tashakkori and Creswell’s (2007) approach and discuss later combine or integrate the qualitative/quantitative element in one of the following ways:

- two types of research questions (with qualitative and quantitative approaches)
- the manner in which the research questions are developed (participatory vs. preplanned)
- two types of sampling procedures (e.g., probability and purposive)
- two types of data collection procedures (e.g., focus groups and surveys)
- two types of data (e.g., numerical and textual)
- two types of data analysis (statistical and thematic), and
- two types of conclusions (emic and etic) representations, ‘objective’ and ‘subjective’, etc. (Tashakkori and Creswell, 2007: 4)

Typically the discussion on integration refers to the sequence and importance (or dominance) of the qualitative/quantitative component. Brannen (2005) usefully provides exemplar studies showing how the second (either qualitative or quantitative) component can be introduced at (a) the design, (b) the fieldwork and/or (c) the interpretation and contextualization phase of any research project.

Whether combining or integrating quantitative/qualitative elements, mixed methods designs arguably contribute to a better understanding of the various phenomena under investigation; while quantitative research is useful towards generalizing research findings (see Chapter 3), qualitative approaches are particularly valuable in providing in-depth, rich data. However, mixed methods research designs do not indicate ‘necessarily better research’ (Brannen, 2005: 183) nor should they be seen as deus ex machina. The data (as in all paradigms) need to be analysed and interpreted systematically and following rigorous theoretical grounding. It is however the case that, when consistent, mixed methods research allows for ‘diversity of views’ and ‘stronger inferences’

...
(Tashakkori and Teddlie, 2003: 674), and as such it is often associated with the concept of triangulation, the focus of the next section.

2.3 Triangulation: An overused term?

Triangulation as a central methodological concept comes high on the list of key features of good research designs (Cohen and Manion, 1994: 233). The way the term is conceptualized by scholars is however epistemologically varied. Denzin’s (1970: 472) early work indicated that there is more than one type of triangulation:

- **Data triangulation** (the application of more than one sampling method for data collection)
- **Investigator triangulation** (the involvement of more than one researcher)
- **Theoretical triangulation** (the use of more than one theoretical stance)
- **Methodological triangulation** (the use of more than one methodology)

Data triangulation and methodological triangulation are arguably the most common operationalizations of the term; the former refers to data gathering methods, while the latter is broader and refers to the use of more that one methodology in a research design. Denzin also drew an interesting distinction between inter-method and intra-method triangulation – the former referring to the use of facets of the same method and the latter referring to the use of two (often contrasting) methods (see Schryer, 1993, for an example).

Triangulation is often one of the key reasons for undertaking mixed methods research. The question, however, is what triangulation means in this context, as the use of the term is not consistent among researchers. According to the typology of mixed methods designs suggested by Greene et al. (1989) – but also more recently by (Bryman, 2006) – the term stands for confluence of findings and corroboration of research results. According to this view, the expectation is that different datasets or different methodologies will lead to similar results and hence allow for confident interpretation (e.g. Lyons, 2000: 280) of the findings and strengthen the researcher’s conclusions. As such the term is also widely associated with the concept of credibility of research findings. A problem associated with this approach is the assumption that data collected using different methods can necessarily be compared and/or contrasted in order to answer the same set of research questions. This view assumes that there is one single objective ‘reality’ or ‘truth’ – not only a problematic assumption (as seen in various chapters of this book), but also, as argued by Harden and Thomas (2005) one that ignores that data from different sources often reveal conflicting realities.

At the same time it is important to stress that triangulation (as defined above) is not the only purpose of mixed methods research. In their early work, Greene et al. (1989) suggested an influential typology of mixed methods designs including four mixed methods purposes (apart from triangulation): initiation – aiming at discovering meaningful contradictions and ‘the paradox’; complementarity – aiming at shedding light on different aspects of the same phenomenon; development – aiming at using findings elicited by the use of one method for the design of the second or subsequent one; and expansion – aiming at broadening the scope and objective of the research (see Tashakkori and Teddlie, 2003, for further discussions of the model, and Bryman, 2006). Bryman (2006) further showed that a large number of scholars undertake mixed methods research in order to further elaborate their findings. I focus on triangulation here as it is the term most commonly used, and also often used in a generic way to refer to all purposes of mixed methods research. As Tashakkori and Teddlie argue, over the years triangulation has become a ‘veritable “magical” word’ (2003: 674), with the concept being criticized for being so broad that it is debatable whether it has any analytical value. Triangulation is so commonly associated with mixed methods research that Tashakkori and Teddlie encourage mixed methodologists to refrain from using it unless they specify how it was specifically defined in their research context (2003: 674).

Having said that, we need not question the value of triangulation per se but we need to differentiate between the technical term and the concept of mixed methods designs as a whole. Even though neither is a panacea for any research design, when applied in relation to a robust conceptual framework (see Creswell et al., 2003) triangulation (in either sense) does lead to a better understanding of complex research questions and environments. For example, Dörnyei (2007) suggests that a better understanding of phenomena can emerge from triangulated findings (whether convergent or divergent), and also reports on the value of mixed methods designs for classroom research where challenges (such as the diversity of student/teacher body) may be addressed through versatile designs (I return to the issue of versatility in relation to mixed methods later in this chapter).

A final point about triangulation emerges from Bryman’s analysis (2006) of 232 articles in the social sciences, suggesting that it is often an outcome of
mixed methods research despite the fact that the desire to triangulate was not the original motivation for opting for this type of research. As put by Holmes and Meyerhoff (2003: 12), 'researchers fruitfully combine aspects of different methodologies to answer the questions that arise in the course of their research; and often they are not concerned with the surrounding epistemological debates (or they take what Teddlie and Tashakkori (2003) describe as the a-paradigmatic stance). In other words, researchers undertake mixed methods research in order to answer their specific research questions without positioning themselves to either qualitative, quantitative or mixed methods paradigms (Harden and Thomas, 2005). Bryman (2006) further usefully distinguishes between rationale (where explicitly stated) and practice: in 27% of all articles he analysed, the researchers did not explicitly state the purpose for undertaking mixed methods research, and out of the 80 articles that applied a triangulation design, only 19 set this as an explicit rationale. Interestingly surveys (quantitative) and interviews (qualitative) seem to be the most dominant methods used by researchers.

Whether explicitly mentioned or not, it remains the case that, multilayered designs are often preferred to one-dimensional ones for eliciting rich findings (e.g. Northey, 1990). To further illustrate this, I now turn to studies that have used a wide range of methodologies in the field of workplace discourse.

2.4 Applying mixed methodologies in research on workplace discourse

Given the multifaceted nature of research on discourse, it has been argued that collecting data from different sources in an iterative way is an appropriate way to address research questions in this area (Beaufort, 2000). While discourse studies are often seen as 'by nature' qualitative, being largely based on naturally occurring 'real-life' data, recent work (e.g. Holmes and Marra, 2002) has shown how quantitative and qualitative paradigms can be combined for a better understanding of the interactants' norms and practices in discourse.

To illustrate the issues addressed in the chapter so far, I now discuss examples of (socio and applied) linguistic studies of spoken and written discourse in the workplace. The objective of this section is not to provide a review of research in the area but to showcase some of the issues involved in bringing together quantitative/qualitative methodologies. As suggested by Bargiela-Chiappini et al., 'one of the defining features of business discourse research is that it has not relied on any one approach or methodology' (2007: 15). As such, it is a particularly apt area on which to focus for the purposes of our discussion here.

Researchers from a number of disciplines (not only linguistics but also management, sociology and psychology) have focused on the workplace as a research site. Moreover, this work operates from different perspectives and with different foci. Within linguistics, the overarching foci of workplace-related research are (a) the identification of patterns of language use and/or development of the skills employees need in order to be competent users of the language(s) for work-related purposes and (b) the study and/or description of the spoken/written language – or rather the discourse – workplace participants engage in. Hence the former often has a pedagogic concern, while the latter is focused on understanding and describing how people communicate, say, in a business/corporate context, and often aspires to make the findings relevant to real-life concerns of employees or practitioners. Put simply, the two areas currently correspond to two broad fields of linguistic research, namely, Language for Specific Purposes (LSP) and (applied) sociolinguistics (see Bargiela-Chiappini et al. (2007) for a succinct overview of the development of the field).

Even though we find work that draws on both of these fields (e.g. in genre analysis, corpus-based studies) and studies that show how research findings on workplace discourse can feedback into teaching practice, these two overarching areas often have different aims and adopt different techniques for data collection and analysis (with the latter often being qualitative rather than quantitative in its aims and objectives). It is not unusual for researchers from one field to be sceptical towards the outputs of the other. Often LSP is criticized for not capturing the diversity and complexity of workplace interactions, by taking a static view of language and by separating the study of spoken and written professional language (Gunnarsson, 1995: 115; see also Holmes and Stubbe, 2003, and Sarangi and Roberts, 1999). Bargiela-Chiappini and Nickerson (2002: 276) go as far as to argue that any static skills-based approach, or indeed any quantitative method, cannot by itself 'meet the needs of business communication'. In fact, any studies (quantitative or qualitative) which rely only on indirect sources, such as interviews with personnel, observations and questionnaires, can and have been criticized for failing to capture the dynamic nature of interactions (Bargiela-Chiappini and Harris, 1997; Holmes and Stubbe, 2003; Stubbe, 2001). This has prompted a large number of studies in workplace discourse which incorporate or are based on naturally occurring
discourse data (e.g., Holmes and Marra, 2002; Sarangi and Roberts, 1999). In the light of such debates, in a recent project on intra-company variation in written processes and products (Angouri and Harwood, 2008), a case was made for more multifaceted, multimethod research on workplace discourse. Questionnaires, face-to-face interviews and participant observations were used and a corpus of real-life data was collected. In this particular study (which is part of a large project on language use in multinational companies), quantitative and qualitative methods were integrated at different stages of the research (in line with Brannen’s 2005 work, discussed earlier in this chapter) in the design, fieldwork and analysis phases. These methods yielded different types of results. The analysis of the naturally occurring data indicated markedly different practices in the various communities of practice studied, while the quantitative data revealed a pattern as to the genres (such as business letters, faxes and emails) the employees had to handle more frequently. The authors argue that variation in practices could not be understood without a closer analysis of ethnomethodological data and a discourse corpus. At the same time, the analysis of the quantitative data showed inter- and intra-company macrovariation according to the informants’ posts. Hence it was through the use of mixed methods that conclusions were drawn on discourse practices in the communities of practice studied. The dialectic relationship between the quantitative and qualitative elements is clear here, as the instruments used to collect quantitative data were designed on the basis of ethnomethodological observations, and the patterns revealed were studied further through a corpus of discourse data.

There are many other examples of mixed methods designs in workplace discourse studies. Jorgensen’s 2008 work on governmental discourse, makes a strong case for combining methodologies in genre analysis, by using interviews, questionnaires and an extensive corpus of written documents. A case for integrating the two paradigms is also made by Holmes and Marra (2002) in a study on the functions of humour in communities of practice within different New Zealand workplaces. I consider this study to be a clear example of how quantitative and qualitative components can be combined to address a research topic that many would associate solely with qualitative research. The quantitative data in this study reveal different frequencies of humour instances as well as humour types. The researchers distinguish between supportive and competitive humour and also classify humour instances according to style (collaborative or competitive). At the same time the closer qualitative analysis of discourse data shows how ‘humour is used’ in the workplaces they study and the way the employees ‘do humour’ (Holmes and Marra, 2002: 1702) to achieve their interactional goals.

The work briefly discussed above has shown how data from indirect sources and quantitative analysis can complement the findings of work focused on the microlevel of naturally occurring interactions, and that there are ‘insights to be gained by applying a range of different theoretical and methodological approaches to the same piece of discourse’ (Stubbe et al., 2003: 380).

However, apart from contributing to more in-depth analyses of research questions, mixed methods research also has an important part to play in reaching diverse audiences and overcoming challenges associated with certain research settings. For example, Mullany (2008) shows how mixing methods (in this case recordings, interviews, observations and written documents) contributed to a wider dissemination of the findings in the form of written reports for the companies involved. Similarly, in my research with seven multinational companies (Angouri, 2007), by using quantitative methods, I was able to identify patterns of foreign language use and the viability of existing language policies, which were major concerns for HR managers. By also drawing on my ethnographic observations and interviews, I produced written reports which turned out to be useful for the companies to assess current strengths and potential areas for further development. Even though my main focus was to examine the role of discourse in ‘how people do things’ particularly in the context of meeting talk in multilingual settings, I soon found out that adding another dimension to my design, namely analysing, from a macro/perspective/quantitatively (foreign) language use in different departments of the company, was not only informative but also the best (and possibly the only) way for me to gain access to this very particular workplace setting. Adding this dimension, which was relevant and important for the HR managers themselves, meant that they in turn were willing to further collaborate and in effect I was able to carry out the rest of the study.

It would then appear that mixed methods have a role to play in overcoming some of the challenges of the workplace as a site of research that is notoriously difficult in terms of gaining access and collecting data. The ‘setting… shape[es] the methods that a researcher is able to employ’ (Mullany, 2008: 46; see also Stubbe, 2001), especially when HR managers are to be convinced of the value of a research project, and research designs need to be adapted to accommodate the exigencies of specific research settings (see Angouri, 2007 for concrete examples). This can be achieved more easily through mixed methods designs.
that can address issues that are of immediate concern to the people involved in the projects. While mono-dimensional studies can and do also result in rich datasets, mixed methods designs are versatile and can arguably address, from a more holistic perspective, issues the participants themselves relate to. As such they provide a powerful tool for research findings to feed back into research settings ‘in order to draw attention to and challenge unquestioned practices’ (Holmes and Meyerhoff, 2003: 14) such as gender and power hierarchies in workplace settings. If research is to produce findings that will be relevant and useful to those being studied, this then needs to be reflected in research designs and methodologies and mono-dimensional studies do not necessarily provide the means to meet this need. This is important, in the light of voices urging linguists and practitioners to work closely together in researching workplace discourse from different angles (see Roberts and Sarangi, 2003), and to draw on the real-life concerns or the ‘habitus’ (Bourdieu, 1993) of both research participants and practitioners. Making linguistic research applicable and relevant to real-world issues is certainly not a new concern for academics (e.g. Sarangi and Candlin, 2003). It is however becoming part of a growing trend in academia, and the emphasis placed on Knowledge Exchange by the Research Councils in the United Kingdom is a clear indication of this.

Before closing this chapter, I would like to consider some of the implications of the issues discussed. First, we should consider scholars’ expected uneasiness and scepticism towards what works’ research designs, given that these designs are constrained in a number of ways. However, factors outside each research project, such as the disposition of academic departments, journals, graduate programmes, funding agencies, policy making bodies (Bramen, 2005), peer pressure (Denscombe, 2008), and the pressure and background training of researchers (Bryman, 2007) affect research designs – most obviously, in the choice of research topics, but also methodologies and methods and in the presentation of research findings. Taschakouri and Teddlie (2003) also discuss what they call the ‘residue of the paradigm wars’ (2003: 699), arguing that it has an impact on both research designs and students, whereby young researchers often find themselves in programmes or organizations that align their work with either the qualitative or quantitative paradigm and ‘proclaim the inferiority of the other group’s orientation and methods’ (2003: 699). As mixed methods are gaining momentum, there is a need for this ‘third’ paradigm to find its place in graduate programmes and research methods curricula. This would involve not only creating the context where issues of researchers’ inclinations, affiliations and accountability are discussed, but also equipping novice researchers with the necessary knowledge and skills for undertaking mixed methods research (and which requires competences in both quantitative and qualitative research). At the same time, mixed methods is not and should not be seen as a necessary alternative and the ‘natural inclination,’ individual preferences and research strengths of researchers should not be overlooked (Dörnyei, 2007: 174). In this vein Green and Preston (2003: 171) suggest caution towards the ‘omni-competent professional research, the generic paragon of knowledge production’

Overall, mixed methods research can and does cross-disciplinary boundaries and overcome limitations that have been associated with mono-dimensional approaches to the study of complex phenomena and research sites (such as the workplace). As we have seen, mixed methods research also helps in making the research relevant to wider audiences, but also in avoiding orthodoxies such as those imposed by mono-dimensional, purist approaches to research that ‘are potentially damaging to the spirit of enquiry’ (Holmes and Meyerhoff, 2003: 15). Accordingly this chapter argues that using a wide range of tools for data collection, and combining quantitative and qualitative paradigms, can provide rich datasets and enhance our understanding of complexities in most research areas in linguistics in general (and workplace talk in particular).

Notes

1 The definition by Creswell et al (2003: 210) is adopted here according to which the term design refers to ‘a procedure for collecting, analysing and reporting research.’

2 The terms emic and etic are widely used in social sciences to refer to accounts that are either particular to a certain group or system (emic) or observations about a group or system from the standpoint of an outsider (etic).

3 See also Creswell et al (2003) for a discussion on generic types of concurrent and sequential designs (referring to the quantitative/qualitative components).

4 Capturing the dynamics of workplace discourse as a field of study is not one of the aims of this paper. I will not distinguish between professional/organizational/institutional discourse and organizational discourse studies. The reader is referred to Grant and Iedema (2005) for a discussion and Bargiela-Chiappini (2009).

5 The concept of communities of practice is frequently adopted in research on workplace discourse. Eckert and McConnell-Ginet (1992: 664) define a community of practice as ‘an aggregate of people who come together around mutual engagement in an endeavor. Ways of doing things, ways of talking, beliefs, values, power relations – in short, practices – emerge in the course of this mutual...’
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endeavor. As a social construct, a community of practice is different from the traditional community, primarily because it is defined simultaneously by its membership and by the practice in which that membership engages.

6 The sample in the study is stratified according to their post and level of responsibility. Three strata are identified, namely, post holders, line managers and senior managers. The line managers are responsible for a subsection of a department or groups of employees within a department, and the post holders are responsible for no one but themselves. Senior Managers are responsible for either a subsection or a department or even a cluster of the company, depending on the company’s size and structure.

Further reading

Dörnyei (2007) – This book provides an up-to-date and very useful overview of research methods in applied linguistics. It discusses qualitative, mixed methods and quantitative projects. It takes a step-by-step approach and examines all stages of research from collecting the data to presenting the findings and writing up academic research. It tackles ontological and epistemological issues and it will be helpful for all students conducting research in applied linguistics.

Tashakkori and Teddlie (eds) (2003) – This edited volume presents a thorough discussion of mixed methods or the third paradigm. Even though it is not aimed specifically at linguists, students and researchers will find it very useful for its overview of recent developments in this area. It also constitutes a comprehensive collection of sampling techniques for mixed methods designs.

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Part II
Quantitative and Corpus Research Methods
Chapter outline
This chapter will introduce readers to the most common concepts and issues of quantitative research. It starts off with a discussion of the general characteristics of quantitative research, based on an exploration of the key differences between quantitative and qualitative methodology, with a clear focus on the former. Based on real-linguistic examples, we will discuss the concept of 'quantifiability' of data — the quality of being measurable — and compare it to qualitative approaches, such as many discourse-analytic frameworks. Section 3.2 also introduces and defines the concepts of quantitative linguistic variables, hypotheses, theories, and laws, as well as reliability and validity. Section 3.3 consists of a critical evaluation of the most frequently used research designs in quantitative research, such as longitudinal, cross-sectional or experimental designs. Section 3.4 looks in some detail at the issues surrounding the use of questionnaires in quantitative research, highlighting general design features, as well as aspects such as question phrasing, sequencing and the various tools available to measure different variables usually of interest in linguistic studies. This section also includes a short discussion of questionnaire coding.

3.1 Introduction
This book introduces some of the various different approaches to collecting and analysing linguistic data, in order to provide readers with a thorough overview of the tools and methods available. At the very end, however, we can distinguish between two basic types of methodological frameworks under which all other methods and approaches — in linguistics or any other
discipline – can be subsumed: qualitative methods on the one side, and quantita-
tive methods on the other. Yet, over the last decade or so, in social science
research this dichotomy has become less rigid, and the use of mixed methods
methodologies and triangulation approaches (the use of several methods to
support each other) has increasingly led to the simultaneous use of quantita-
tive and qualitative methods (for a concise summary, see Flick 2006, *inter
alia*; also see Chapter 2), whereby ‘structural features are analyzed with quan-
titative methods and processual aspects with qualitative approaches’ (Flick,
2006: 33).

For the sake of clarity and due to the limited scope of this chapter, I will
have a closer look at quantitative methods in a rather isolated way only,
with specific reference to their application in linguistics and other language-
related subjects. This chapter starts with a comparison between quantitative
and qualitative methods in general (section 3.2), followed by a discussion of
various research designs that can be used under a quantitative framework
(section 3.3). In the last part (section 3.4), we take a closer look at the design
and use of questionnaires. Questionnaires come with the reputation of being
a quick and easy way to amass vast amounts of data and are hence a tool
frequently used in quantitative studies. Yet, as we will see, questionnaires, like
any other methodological tool, need thorough planning in order to provide
valid and reliable data.

### 3.2 Quantitative versus qualitative methods

There are probably only few issues in research that are as fundamentally mis-
understood as the difference between qualitative and quantitative approaches
to data analysis. This misconception comes from the use of the terms in daily
discourse, where ‘quality’ usually refers to ‘good’ (unless something is of ‘bad
quality’), whereas ‘quantity’ frequently refers to ‘much’. When we use the terms
qualitative and quantitative in the context of a methodological framework,
h owever, we have to modify these definitions. The following is an extract from
a conversation between a mother (M) and a 2.5-year-old child (C) (Peccei,
1999: 95).

C: daddy is coming down too
M: who’s coming down too?

C: daddy
M: daddy? No where’s daddy?
C: me want – daddy come down
M: working sweetie
C: no no find her cheque book
M: finding her cheque book

There is a multitude of ways to analyse these eight lines. We could, for
example, look at the transcript with a focus on the conversational exchange
between mother and child, with reference to theories of first language acquisi-
tion, such as child directed speech. In this case, we would mainly be interested
in what is going on between the two interlocutors during the conversation: there
is a clear question and answer sequence, and we could argue that the mother, as
the linguistically more competent, is guiding the exchange – not to say she is
controlling it. She is also, to a certain extent, adjusting her language, for example
syntactic complexity, towards a linguistically less competent child. In general
terms, we could look for certain patterns or sequences in the text in order
to come to a result. Yet in other words, we could analyse the text with regard to its
main characteristics or qualities – and hence carry out a qualitative analysis.

However, we can also take an entirely different approach. Language
acquisition research is, ultimately, always concerned with the development of
linguistic proficiency, and in first language acquisition, the Mean Length of
Utterance (MLU) has been around for a long time as a frequent – albeit some-
what unreliable – way of measuring children’s first language proficiency and
development (see, *inter alia*, Bates et al., 1995; Whong-Barr and Schwartz,
2002). The MLU is an index which tells us, as the name implies, the average
length of children’s utterances in words or morphemes. To calculate the MLU
for our example, we count all of C’s words and divide it by the number of
utterances:

\[
\text{MLU} = \frac{17}{4} = 4.25
\]
For our example, the MLU is 4.25, that is, on average the child produces utterances of 4.25 words length. So, the MLU allows us to put a numeric value onto something that originally is nothing else but text; in other words, it allows us to quantify proficiency by giving us a - more or less meaningful - number. Unsurprisingly, then, the MLU is a quantitative measure.

Put briefly, qualitative research is concerned with structures and patterns, and how something is; quantitative research, however, focuses on how much or how many there is/are of a particular characteristic or item. The great advantage of quantitative research is that it enables us to compare relatively large numbers of things/people by using a comparatively easy index. For example, when marking student essays, a lecturer will first look at the content, the structure and coherence of the argument, and the presentation, that is, analyse it qualitatively, but will ultimately translate this into a mark (i.e. a number), which allows us to compare two or more students with each other: a student gaining a 61% did better than a student achieving a 57%, because 61 is larger than 57 - we do not need to look at the essays per se once we have the numerical, quantitative value indicating their quality. Quantitative data can be analysed using statistical methods, that is, particular mathematics tools which allow us to work with numerical data.

There is another fundamental difference between qualitative and quantitative studies. Qualitative studies are, by their very nature, inductive: theory is derived from the results of our research. A concrete example: Rampton (1995) in his study on linguistic 'crossing' was interested in how South Asian adolescents growing up in the United Kingdom use code-switching between English and Punjabi to indicate their social and ethnic identity. Using interview data from interaction between teenagers of South Asian descent, he identified particular patterns behind code-switches, and was able to infer what the underlying 'rules' with regard to use of a particular language and construction of identity were; as such, he used an inductive qualitative approach: theory was derived from (textual) data.2

Quantitative research, however, is deductive: based on already known theory we develop hypotheses, which we then try to prove (or disprove) in the course of our empirical investigation. Hypotheses are statements about the potential and/or suggested relationship between at least two variables, such as 'the older a learner, the less swear words they use' (two variables) or 'age and gender influence language use' (three variables). A hypothesis must be proven right or wrong, and hence, it is important for it to be well defined. In particular, hypotheses must be falsifiable and not be tautological: the hypothesis 'age can either influence a person's language use or not' is tautological - independent from our findings, it will always be true. A good hypothesis, however, must have the potential of being wrong. For a detailed discussion of hypotheses (and laws, and how they can be combined to form theories), see Scott and Marshall (2005).

A typical example is the age of acquisition onset debate in second language acquisition research. Based on a now substantial body of previous research (see, for example, Birdsong and Molis, 2001; Johnson and Newport, 1991), we can develop a particular hypothesis, such as 'second language learning becomes more difficult the older a learner is.' In a quantitative approach, we use these hypotheses and develop a methodology which enables us to support - ideally to prove - their correctness or incorrectness. In the example, this is usually done by finding adequate numerical measures for language proficiency, whereby a high value indicates high proficiency. Age, by its very nature, is already a numerical value, so, using appropriate statistical methods we can compare how the two sets of values - proficiency and age - are related, allowing us to draw a conclusion about the relationship between these two factors and to prove our hypothesis right or wrong: if the age values go up while the proficiency values decrease, there is some evidence that our hypothesis 'the older the learner the more difficult it is to learn a second language' is true.

Talking about quantitative methods inevitably means talking about variables, and it is worth defining what exactly variables and other crucial concepts in quantitative research really are - particularly since misconceptions of these terms may lead to serious problems during any quantitative study. The Oxford English Dictionary (OED) defines variable (noun) as

Something which is liable to vary or change; a changeable factor, feature, or element

In slightly different words, a variable is a feature of a particular case, and a particular case can take one of a set of possible features. An example: a frequent variable in linguistics (and other social and psychological sciences) is gender. Gender is a variable which, with human beings, can have two possible values: male or female. Now imagine we are standing in front of a class with 20 students and we are trying to find out how many women and how many men we have in the class: in this example, we have 20 cases, that is, 20 'items' for which we have to assign a particular value for the variable 'gender'. Now comes the important part: every case can only take one value (or 'outcome') for the
particular variable, that is, any one student in our class can only be *either* male or female, but cannot be both at the same time.\(^3\)

The attribution of a particular variable outcome – male or female – to a particular case is made by means of measurement: we assign a variable value to a particular case using predefined criteria. And here is the crux of the matter: how exactly do we define these criteria? Let’s assume that, when assigning gender, we only take into account certain physical features of a person, and based on our experience and preconceptions, we come up with the following three criteria for our two gender categories:

<table>
<thead>
<tr>
<th>Female</th>
<th>Male</th>
</tr>
</thead>
<tbody>
<tr>
<td>Long hair</td>
<td>Short hair</td>
</tr>
<tr>
<td>No facial hair</td>
<td>Facial hair</td>
</tr>
<tr>
<td>Wears make-up</td>
<td>Does not wear make-up</td>
</tr>
</tbody>
</table>

Two problems should immediately strike us: First, how exactly do we define ‘long hair’ and ‘short hair’? In other words, we again need certain predefined criteria for our defining criteria. Second, what about men who have long hair, are clean shaven and wear make-up? Or women with short hair who do not wear make-up? Inevitably, our criteria will fail to assign the correct gender value; that is, by using our three criteria we cannot accurately gender men. We would probably have to use other, more biologically founded ones (admittedly rather difficult in a classroom setting).

This rather daft example illustrates one of the most important aspects of quantitative research (and indeed all research): whenever we want to quantitatively measure something, that is, assign a variable value to a particular case, we need to thoroughly think about a reliable way to make this decision. We need a set of clear and objective definitions for each category or outcome. Moreover, our measure should be designed in such a way that it comprises as many cases as possible. For example, for human beings it is usually sufficient to define two values for the variable ‘gender’: however, in the animal kingdom, and especially with some invertebrates, ‘male’ and ‘female’ might be categories which are just not up to the job, as organisms such as worms or sponges are hermaphrodites, that is, have *both* male and female characteristics. So which category to put them into, bearing in mind that any one variable can only have one outcome for any one case?

Let’s think about a more linguistic example. Traditionally, dialectology, and later sociolinguistics, has looked at the presence, absence, or different realization of certain linguistic features, often in the area of phonetics and phonology, but also in morphosyntax. Milroy in her well-known Belfast study (1987), for example, has looked at, among many other things, how the realization of the vowel /æ/ in different linguistic environments, particularly the merge of the /æ/ as in *peck* with /æ:/ as in *pack* into homophones, relates to the degree of a speaker’s inclusion into the social network, with a high frequency of non-standard /æ:/ in both contexts indicating a higher degree of inclusion (1987). To cut a long story short, at the very end it comes down to measuring (in this case, counting) the number of different realizations of the vowels: how often does /æ/ occur in words such as *peck*, and how often is /æ/ replaced by /æ:/ making it homophone to *pack*. Anyone vaguely familiar with phonology will know that this can be difficult at times, and it is important to establish a clear set of rules as to what constitutes an /æ/ and what counts as an /æ:/. Depending on the level of detail needed, we may have to go as far as a proper acoustic analysis using specialist equipment and software to find out the exact physical properties of a sound and base our decision on this. We may say, anything up to x Hertz counts as an /æ/ and everything below as an /æ:/.

This procedure that leads to the ‘translation’ of (physical) properties of a case into a numerical value is known as operationalization.\(^4\)

Once we have established our measure and have operationalized it, we must not ever change it in the course of our study, as this will distort the results. For example, most of us have a rather good idea of how long an inch is, so if someone tells us that an object is about 2 inches wide, we implicitly know its width. However, this only works because an inch *always* refers to the same amount of length (namely around 25 millimetres). Imagine someone would arbitrarily change 1 inch to 45 millimetres – how could we possibly make any reliable statements about an object whose width is 2 inches if we do not exactly know what an inch refers to?

Closely related to the issue of measurement are the concepts of *reliability* and *validity*. Reliability refers to our measure repeatedly delivering the same (or near same) results. Ideally, if we use the same measure with the same people under the same conditions, our measure should give us the same result. In basic chemistry, this works well: if we add exactly the same amount of chemical A to exactly the same amount of chemical B, with external conditions such as temperature being identical, we should reliably get chemical C. Working with human beings is more difficult. For a start, external factors are notoriously difficult to keep constant. Also, people learn from experience, so if we run the same test with the same people again and again, they will – eventually – improve just through experience. A common way of checking reliability, the *test-retest*
method, is hence problematic. A quick and easy solution to check a measure's reliability is the 'split-half' method (see, for example, Schnell et al., 2005: 152): we take a group of people, measure whatever we like to measure, then randomly split the group into two smaller groups and compare the results. If the measure is reliable, we should get very similar results for both subgroups. If we get substantially different results, we should become very cautious and investigate the reliability a bit further, through re-tests (with other people!) or by adjusting the measure.

Validity, however, can be more problematic. It refers to our measure actually measuring what it is supposed to measure. Hence it is also known as measurement validity or instrument validity (Bernard, 2006: 38). 2 Validity is often an important issue when using questionnaires – as discussed in section 3 of this chapter – and in particular when we measure abstract concepts such as attitudes. There are several sophisticated mathematical procedures for checking a measure's validity, all of which go beyond the scope of this chapter; Bryman (2004) and Scott and Marshall (2005) provide good overviews on these issues, while authors such as Allen and Yen (1979/2001) or Kaplan (2004) discuss the mathematical intricacies of measures such as 'Cronbach's Alpha' – a mathematical approach to determining reliability. The easiest, but only to a certain extent reliable, way to insure validity is to use common sense: if we get significantly different results from previous research, under very similar circumstances, we should carefully look at our method before we get too enthusiastic about our results. We will return to the issue of validity in section 3.

3.3 Research designs

In the previous section we have looked in some detail at variables and measurement, and have outlined some basic definitions. Assume we would like to investigate the impact of corrective feedback given by a caregiver on 2-year-old children's first language acquisition. Based on previous research, we have a clear hypothesis in mind: 'The more corrective feedback children receive, the quicker they progress' – bear in mind we are working deductively, so we already have the theory. Let's also assume we have a set of well-working methods to measure both the amount of feedback and language development; both are quantitative measures so we can later process our results statistically, trying to prove or disprove our hypothesis. What we need to do now is to think about the actual structure of how we go about our study, in other words, we have to consider the research design.

The research design is best understood as a framework or scaffold around which we organize our study, but it does not refer to the actual tools we use to carry out our research (questionnaires, recordings, etc.). In other words, not only do we need a set of tools to get our data, we also need to think about a coherent and solid framework around which we organize our data collection. For example, we might have a well-working questionnaire (which we have used before, and which we know is reliable and valid) and a brand-new digital recording device. However, we need to think carefully about how, when, in which order, and who with (in terms of sample) we deploy them. If we just randomly record people and ask them to complete the questionnaire, what we will get is a pile of data (good!) but certainly not the kind of data we want and need in order to answer our research questions (bad!).

It should not take too long to see that research design, theoretical background and actual methods used are inseparably linked and form the overall framework for our study, hence it is crucial that these three parts work well together. We can imagine research designs to be designed either along the dimension 'time' or the dimension 'cases', and we will discuss the different types in each dimension in what follows.

Research designs frequently used in linguistics, psychology and other social sciences are cross-sectional designs: we collect a comparatively large amount of data at one point in time, hence obtaining a snapshot of the status quo. In our example, in order to establish the impact of feedback on 2-year-old children, we would measure both proficiency and feedback for a group of, for example, a hundred 2-year-old children, and, using statistical methods, look at how the two variables are related. This would provide us with a cross-sectional view or 'snapshot' of the relationship between proficiency and feedback.

Longitudinal studies, however, are based on the repeated collection of data over a longer period of time, hence enabling us to observe any changes in variables which may occur over time. We may, for example, take a 12-month-old child and, over a period of two years, that is until age 3, assess both its proficiency and the extent of feedback in regular intervals by testing it every six months. In this example, we get data at five points in the child's life: at 12, 18, 24, 30 and 36 months of age, which will enable us to trace the child's development – something we cannot do using a cross-sectional design with only one data collection.

Longitudinal designs come in two types: panel designs use a sample randomly drawn from the population, and data is taken repeatedly from the members of the panel. Cohort designs are slightly different, in that the members of
the cohort share certain – often temporal – characteristics. For example, we may be interested in the change of attitude towards the use of taboo words over time (hypothesis: older people are more critical towards taboo words than younger ones). In a panel design, we randomly select 100 people from the population, both male and female, from all socioeconomic backgrounds and all age groups. In a cohort design, we may select a particular cohort, such as 100 ethnically white adolescents between the age of 15 and 17, and we observe them for let’s say five years. According to Bryman (2004), the crucial difference between panel and cohort designs is that while panel designs allow us to observe both cohort and aging effects, cohort studies can only identify aging effects, hence allowing us to control for third variables. In our taboo word example, we may only be able to observe that with increasing age, tolerance towards taboo terms decreases, but with a heterogeneous group we cannot account for exactly what is responsible for this change. With a cohort design as outlined, we can more accurately pin down age as a major factor contributing to the change in attitudes.

The biggest advantage of longitudinal designs – the ability to observe change in real time – is also its biggest disadvantage: if we want to observe a group of people over a prolonged period, we must make sure that these people are available for observation over the entire period; in other words, we have to consider the difficulty of sample retention. Another problem is resources: repeated observations and/or testing cost time and money, both of which are increasingly unavailable in research. An elegant way to circumvent problems related to longitudinal designs is to simulate them. In particular, in Labovian sociolinguistics, this is known as real time and apparent time studies. Bayley (2004) explains that we can design a cross-sectional (or synchronic) study in such a way that we can infer, to some extent, diachronic, that is longitudinal, development. For example, Woods (2000) in her study on sound changes in New Zealand, collected data from three generations of one family at (more or less) the same time (the ‘real time’), and was able to use generational differences to ‘simulate’ time and make inferences about longitudinal change (the ‘apparent time’).

An entirely different approach to research design is to look at it not from a temporal point of view (like the designs discussed above), but to consider how data is collected. In particular in sociolinguistic research – longitudinal or cross-sectional – language is observed in its natural environment, that is, when it is used by its speakers, and the data we obtain is ‘natural’, spontaneous speech. In technical terms, this way of collecting data does not allow us to manipulate the variables we are interested in: we might be interested in whether a particular speech community shows a particular linguistic feature, but through observation we can only observe – not manipulate how frequently members of this community actually use this feature. This is where experimental designs come into play. In experimental designs, we as researchers deliberately and explicitly manipulate the variables in order to prove/disprove our hypothesis. In addition, experiments usually comprise two groups of participants: the experimental group (EG), that is, the group that is undergoing the ‘treatment’ or stimulus, and the control group (CG), which is unaffected by the stimulus. Li (1988) analysed the impact of interaction on second language learners’ comprehension using a pre-/post-test set-up based on three groups: an EG 1, receiving premodified input, but no interaction; an EG 2, receiving interaction but no premodified input, and a CG receiving neither. A pretest showed that there were no significant differences between the three groups. After the introduction of the different stimuli, though, Li observed changes in comprehension in the two EGs, but less so in the CG, as illustrated in Table 3.1.

Li’s study is interesting as it combines two types of experimental set-ups in one: it is a within-subject design, as it compares members of a group (e.g. EG 1) in two situations, namely pre- and post-stimulus, but is also a between-subject design as he compares several groups with each other. A ‘pure’ within-subject design tests only one group of people twice (pre-/post-stimulus), while a pure between-subject design compares EG and CG once. Both within- and between-subject designs have advantages and disadvantages. Probably the most problematic issue about within-subject designs is the fact that repeated testing of the same group can lead to participants’ performance changing through

<table>
<thead>
<tr>
<th>Step 1</th>
<th>Step 2</th>
<th>Step 2</th>
<th>Step 4</th>
<th>Step 5</th>
<th>Step 6</th>
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<tbody>
<tr>
<td>EG 1</td>
<td>P</td>
<td>EG 1 =</td>
<td>Stimulus 1</td>
<td>P</td>
<td>EG 1 =</td>
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<td>T</td>
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<td>T</td>
<td>EG 2 =</td>
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<td>E</td>
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<td>T</td>
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<td>T</td>
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<td></td>
<td>S</td>
<td></td>
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<tr>
<td>CG</td>
<td>No Stimulus</td>
<td></td>
<td></td>
<td>CG</td>
<td></td>
</tr>
</tbody>
</table>

Table 3.1 Experimental pre-/post-test set-up with three groups
experience with the task, boredom or fatigue. Between-subject designs are arguably more difficult to control for other factors, as they only produce reliable results when both groups are very equal in terms of their characteristics (e.g. age, gender, linguistic proficiency). A careful consideration of the research question and other factors (resources being increasingly one of them) is hence essential for the choice of experiment type.

3.4 Panacea questionnaires: Design, use and abuse

There are probably as many different methodological tools for collecting quantitative data as there are research projects. We test, record and measure, trying to come to meaningful answers for our research questions; and as every undergraduate student is told in their first year at university, these methods need to be carefully adapted to provide us with the data we require. One method (or rather type of method) which is frequently used for collecting data across most linguistic subdisciplines are questionnaires. Questionnaires are frequently used to measure people’s attitudes to and perception of languages (or variations of particular languages, such as dialects and accents) or groups of speakers. Prominent examples for the effective (and extensive!) use of questionnaires include studies surrounding the concept of ‘ethnolinguistic vitality’ (see, *inter alia*, Bourhis et al., 1981; Giles et al., 1977), or investigations into language use and choice (e.g. Extra and Tagnun, 2004; Rasinger, 2007).

In this final section, we will have a closer look at the issues surrounding the use of questionnaires in quantitative research, highlighting design, advantages and pitfalls. This section is best read in conjunction with Chapter 4 (following in this volume), which discusses the processing and analyzing of data generated by questionnaires.

Let’s start with having a look at one of the major benefits of questionnaires: they can, potentially, generate a large amount of data which is comparatively simple to process. While interviews are time-consuming to conduct and transcribe, and the coding of qualitative data is sometimes difficult, questionnaires, with their neat tick-boxes, seem like a blessing. Unfortunately, it is not that easy. Questionnaires must be perfect before we distribute them: we must be confident that they work well and that they reliably generate valid data. A questionnaire that is in the hands of respondents cannot be changed – it either works, or it does not. Questionnaire design is a complex area and a detailed discussion goes far beyond the scope of this chapter (or even this book), so we will focus on some of the core aspects.

A common problem, especially for student researchers, is the number of questions a questionnaire should include. As a general guideline, a questionnaire should include exactly the number of questions it needs to investigate a particular issue validly and reliably – no more, no less. Before we start writing our questionnaire, then, we should therefore ask ourselves the following two questions:

1. What data do I want my questionnaire to give me, that is, which of my research questions should it answer?
2. Which questions do I aim at answering my research questions?

Less experienced researchers will stumble across the first question – very often, research questions are too vague and need to be defined more clearly (see also Chapter 1). But even for the most experienced of us, the second question can pose a major problem. How do I phrase my questions so they address exactly the issues I want to investigate? Here, we will focus on a few guidelines that can help us to solve this problem.

**Ask what you need to know** A common problem is questions that have been, quite simply, badly phrased and do not address the actual issue. For example, a student of mine is looking at the impact of learners’ motivation on their L2 English development. As one of the key questions in a questionnaire, she planned to ask a group of teachers:

*Do you think the students are interested in learning English?*

On the surface, this might do the job. It allows for a yes/no answer, and she could eventually count the instances of ‘yes’ and ‘no’ answers to draw whatever conclusions she wants to draw. However, on second sight, the question does not actually give us any useful information, just because all we get is either a ‘yes’ or a ‘no’. Even worse, the respondents might be unable to answer the question as such because the available answer options are too general. What we would really like to know is not only whether students are interested in a subject or not, but to what extent they are interested in it. And hence, the question needs to be rephrased accordingly:

*To what extent do you think your students are interested in learning English?*
With questions like this one, questionnaires usually give their participants a range of available answer options, usually in the form of a scale or a semantic differential: respondents can indicate their answer on a numerical scale (where a higher number signals higher agreement) or on a scale between two opposing terms:

'On a scale from 1 to 5, whereby 5 indicates "very interested" and 1 indicates "not interested at all", to what extent do you think your students are interested in learning English? Please circle your answer.'

1 2 3 4 5

This time, the question includes two types of information: whether teachers think students are interested or not – replacing the former 'yes/no' option – but also the extent to which their teachers think they are interested.

A related concept is Likert scales, where respondents indicate their agreement or disagreement to a particular statement on a scale. For example, we may want to measure how satisfied first year linguistic students are with their choice of academic discipline. We produce a set of three questions, based on 5-point Likert scales

Please indicate how strongly you agree or disagree with the following statements on a scale from 1 to 5, with 1 meaning "strongly disagree" and 5 meaning "strongly agree": Please circle your answer.

(1) I could not live without linguistics

(2) Linguistics is the only passion in my life

(3) Linguistics has changed the way I see the world

It may take some time to getting used to phrasing questions in such a way that they give you exactly the kind of information you need, and this presupposes that you yourself are absolutely certain what kind of information you actually want – is the question you want to ask worth asking, and how can you phrase it to get the most information out of it? All too often we do not think about this thoroughly enough.

Ask comprehensive and 'objective' questions Related to this issue is the fact that we as researchers are experts in the field we are investigating, whereas most of our respondents are usually not. Hence, we should avoid using any technical terminology or jargon as there is a substantial risk that respondents do not understand them.

A common misconception is that a questionnaire should be designed in such a way that it gives you the answers that fit your hypothesis and argument best. Sometimes questions are phrased in such a way that they imply a particular answer; other questionnaires avoid questions which bear the potential of eliciting an 'unwanted' response altogether. However, questionnaires are nothing but scientific tools that help us to measure different aspects of 'reality' – very similar to a voltmeter measuring an electric potential. And as such, it must measure neutrally and objectively. That means that questions should avoid as much as possible being biased or leading; in other words, they should not be phrased in such a way that they imply the 'correct' answer – quite simply because there is no 'correct' answer per se. Typical (and rather extreme) examples of leading questions take the form of 'Don't you think that...?' or include semantically strongly loaded terms which are best avoided, for example, 'good/bad' and their synonyms, 'ugly,' 'stupid' or 'unnecessary' (see also Litosseliti, 2003). Try this: Compile a list of adjectives and adverbs and test how different people react to them – you will be surprised by the differences in reaction you receive.

Open versus closed questions and multiple item responses We could have an endless debate about what is better: open questions, which allow respondents to write down their answers in their own words, or closed questions which provide respondents with a set of possible answers to tick from. From a quantitative point of view, the latter is preferable as they are just easier to process. Similar to the phrasing of questions, we have to take great care in designing our answer options. Since respondents cannot give an answer in their own words, we must provide them with a set of all possible (and/or relevant) answers in order to get an accurate picture. Hence, especially with large-scale studies, researchers often conduct prestudies with interviews or focus groups (see, for example, Litosseliti, 2003 for an overview; and Harris, 2006, and Spotti, 2008, for examples) to see what potential issues/answers a particular topic raises.

When designing answer options, especially scales or semantic differentials of the 'agree/disagree' type, we also have to be aware of what is known as response sets and acquiescence responses (see Johnson, 2005, or Pint, 2005). The former refers to some people's tendency to go for a particular direction of the scale, for example, 'agree, independent' from what they might actually think. The latter is the phenomenon whereby respondents give the answer which they think is the 'correct' one – it is particularly frequent with questionnaires dealing with socially delicate issues where political correctness or constructing a particular version of self may override true thoughts or genuine beliefs. Too many response set and acquiescence responders may have a negative impact on your questionnaires' validity. Thus, it is important to phrase
both questions and answer options carefully. In Rasinger (2008) I discuss question and answer designs which avoid response sets in more detail.

Before we can move on and analyse our data – Erez Levon will guide you through this in the next chapter – we need to go through a final step: the coding of the questionnaire. So far, our questionnaire consists of nothing more than ticked (and unticked) boxes and a few numbers (for respondents’ age, for example) or possibly individual words or short phrases (in open-ended questions where respondents are asked to write down their answer). The use of computer software for coding will be extremely useful at this stage. I discuss the coding of questionnaires with specific reference to analysing data using the Microsoft Excel software in detail in Rasinger (2008), so will limit the explanations here to the basics.

Essentially, in order to enable a computer-assisted analysis, we need to ‘translate’ all variable outcomes in our questionnaire into a neat set of numbers. If the variable is already a number, we do not need to do anything but can transfer this straight into our programme. For example, if a respondent’s age is 25 (years), then we can input 25 without any ‘translation’. It becomes slightly trickier when we have a question regarding gender (or sex) and provide respondents with two tick-boxes: one for male, and one for female. Because some statistical software is unable to deal with text, we may need to translate our answer options into numbers. A common way of coding sex is to assign the number ‘1’ to ‘male’ and the number ‘2’ to ‘female’ (or vice versa). Depending on whether a respondent is a woman or a man, we can then input ‘2’ or ‘1’ respectively, into our software. In theory, for this type of categorical data (see Chapter 4), we can allocate any two different numbers (such as ‘23’ for ‘female’ and ‘88’ for ‘male’), but it makes sense to keep it simple and logical.

Imagine the respondent whose questionnaire we are inputting right now is John, who was born in 1980 and is 28 years old. The data matrix for John would hence look like Table 3.2; apart from the respondent identifier (first column), all data is in numbers. Note that we have coded ‘male’ as ‘1’.

<table>
<thead>
<tr>
<th>Table 3.2 Fictive data matrix</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Respondent</strong></td>
</tr>
<tr>
<td>----------------</td>
</tr>
<tr>
<td>John*</td>
</tr>
</tbody>
</table>

*In real life it is good practice if not a legal requirement, to use pseudonyms or abbreviations so as to ensure respondents’ anonymity.

The coding of all other variables works analogically: every potential variable value is assigned a particular numerical value (i.e. a number). If, for example, we have a Likert scale with the options strongly agree, agree, neutral, disagree, strongly disagree, we would assign numbers from 1 to 5 (or any other sequence of numbers that logically reflects the hierarchical order of answers) to each value (although we may want to inverse the order):

<table>
<thead>
<tr>
<th>Strongly agree</th>
<th>Agree</th>
<th>‘Neutral’</th>
<th>Disagree</th>
<th>Strongly disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

A final example, based on our discussions of Likert scales (see above) and questionnaire coding: Susan is a 19-year-old linguistics student, who could hardly live without linguistics (variable NOLIFE), which is her one and only passion in life (PASSION); the respondent has, in fact, dramatically changed the way she sees the world (VIEW). Her data matrix would look like Table 3.3.

<table>
<thead>
<tr>
<th>Table 3.3 Data matrix</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Respondent</strong></td>
</tr>
<tr>
<td>-------------------</td>
</tr>
<tr>
<td>Susan</td>
</tr>
</tbody>
</table>
our data 'talk', that is, how to perform a quantitative analysis that enables us to answer our research questions and prove our hypotheses.

Notes

1. This example is obviously greatly simplified.
2. Nowadays it is difficult to argue that there is no theory whatsoever on any one research topic. However, qualitative research is not aimed at proving theories.
3. For the sake of illustration, I refrain from discussing biological borderline cases.
5. There are other, even more complicated forms of validity which we shall ignore here.
6. I deliberately put the terms 'expert', 'objectively', 'reality' and 'untruly' in inverted commas, as all of them are inherently problematic: can anything involving a human mind ever be fully unbiased?
7. Cameron et al. (1992) provide an interesting discussion of this issue.

Field (2005) provides an excellent introduction into analysing data using SPSS.

Further reading

Bayley (2004) – This chapter thoroughly discusses real- and apparent time research designs in the context of language change and linguistic development.

Bryman (2004) – An introductory textbook geared towards the social sciences, which provides a comprehensive starting-point for all aspects related to quantitative and qualitative research.


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