

methodological schism. In research texts it has become standard usage to refer to the two approaches as *QUAL* and *QUAN* when contrasting them, and I will sometimes follow this practice.

2.1 The qualitative–quantitative distinction

Although at first sight the difference between qualitative and quantitative data/research appears to be relatively straightforward, the distinction has been the source of a great deal of discussion in the past at every conceivable level of abstraction. Without dwelling on this issue too long, let me offer a taste of how things can get very complicated when we start discussing the *QUAL*–*QUAN* contrast.

To start with, is there really such a contrast? And if so, where exactly does it lie? Richards (2005), for example, points out that the numerical versus non-numerical distinction does not give us clear enough guidelines because qualitative researchers would almost always collect some information in numbers (for example, the age of the participants), and similarly, quantitative researchers usually also collect some non-numerical information (for example, the gender or nationality of the participants). So, as she concludes, ‘qualitative and quantitative data do not inhabit different worlds. They are different ways of recording observations of the same world’ (p. 36). Arguing in a similar vein, Miles and Huberman (1994) assert that in some sense, all data are qualitative because they refer to ‘essences of people, objects and situations’ (p. 9); sometimes we convert our raw experiences of the social world into words (i.e. *QUAL*), at other times into numbers (i.e. *QUAN*). Therefore, Sandelowski (2003) actually concludes that qualitative research is not clearly distinguishable from quantitative research because there is no consistent manner in which such a comparison can be made.

Even though I agree that *QUAL* and *QUAN* are not extremes but rather form a continuum, we still tend to compare them all the time. Why is that? I would suggest that the almost irresistible urge to contrast qualitative and quantitative research goes back to three basic sources of division between the two approaches: (a) an ideological contrast, (b) a contrast in categorization, and (c) a contrast in the perception of individual diversity. Let us look at these contrasts one by one.

2.1.1 Ideological differences

Although scholars in the social sciences (for example, in sociology) have been using both qualitative-like and quantitative-like data since the beginning of the twentieth century, the *QUAL*–*QUAN* distinction only emerged after number-based statistical research became dominant in the middle of the twentieth century and some scholars started to challenge this hegemony flying the ‘qualitative’ banner. (The genesis of the two approaches will be discussed in more detail in separate sections below.) Thus, the terms ‘qualita-

tive' and 'quantitative' were originally introduced as part of, or rather for the purpose of, an ideological confrontation. In a thoughtful analysis, Schwandt (2000) describes qualitative inquiry in general as a 'reformist movement', uniting a wide variety of scholars who appear to share very little in common except their general distaste for the mainstream quantitative paradigm. As he writes,

qualitative inquiry is a 'home' for a wide variety of scholars who often are seriously at odds with one another but who share a general rejection of the blend of scientism, foundationalist epistemology, instrumental reasoning, and the philosophical anthropology of disengagement that has marked 'mainstream' social science. (p. 190)

Having been created in the spirit of antagonism, we should not be surprised that the two terms are still often used to represent contrasting views about the world around us.

2.1.2 Contrasting categorizing/coding practices

One thing that is common to every research approach is that the almost limitless information obtainable from the social world around us needs to be reduced to make it manageable. Researchers typically use 'categories' or 'codes' to structure and shape this information, but this is where the similarities between QUAL and QUAN end. We find that the nature of the categories and the categorization process in QUAL and QUAN are very different. In fact, Bazeley (2003: 414) argues that 'Codes—the way they are generated, what they stand for, and the way they are used—lie at the heart of differences between quantitative and qualitative data and analysis tools'.

Quantitative researchers define the variables they work with well in advance and assign a logical scale of values to them, which can be expressed in numbers. Thus, quantitative research can start a research project with precise *coding tables* for processing the data (for example, within the 'gender' variable, 'male' is to be assigned 1 and 'female' 2). Qualitative researchers also use coding extensively, but the QUAL categories are different in two important ways. First, they are not numerical but verbal, amounting to short textual labels. Second, they are usually not determined a priori but are left open and flexible as long as possible to be able to account for the subtle nuances of meaning uncovered during the process of investigation. For example, if we wanted to draw the boundary between two countries in an unknown terrain, the QUAN approach would be to take the map and after defining the size distribution of the two countries, draw straight lines using a ruler. In contrast, the QUAL approach would resist this top-down decision making but would expect the boundaries to naturally emerge using the inherent geographical properties of the terrain (for example, rivers and mountain ridges).

2.1.3 Different approaches to individual diversity

Most data collected in the social sciences, regardless of whether it is QUAL or QUAN, is related to *people*—what they do, what they are like, what they think or believe in, what they plan to do, etc. Because people differ from each other in the way they perceive, interpret, and remember things, their accounts will show considerable variation across individuals. The problem is that no matter how well-funded our research is, we can never examine all the people whose answers would be relevant to our research question, and therefore we have to face the fact that the final picture unfolding in our research will always be a function of whom we have selected to obtain our data from.

Both QUAL and QUAN researchers acknowledge this link between the specific sample of participants examined and the results obtained by the research, but the two camps consider the issue in a very different light. Quantitative researchers regard the sample-related variation as a problem which needs to be fixed. The QUAN solution is to take a large enough sample in which the idiosyncratic differences associated with the particular individuals are ironed out by the sample size and therefore the pooled results largely reflect the commonalities that exist in the data. Qualitative researchers, on the other hand, question the value of preparing an overall, average description of a larger group of people because in this way we lose the individual stories. They see this as an undesirable reduction process because in QUAL terms the real meaning lies with individual cases who make up our world. Of course, qualitative researchers are not oblivious to the fact that individuals are different, but rather than believing in a higher-level meaning that can be arrived at by summing up individual cases, they hold that there are multiple meanings to discover.

Thus, quantitative researchers follow a ‘meaning in the general’ strategy, whereas qualitative researchers concentrate on an in-depth understanding of the ‘meaning in the particular’. However, the story does not end here because the ‘big number’ approach of quantitative researchers has offered an additional bonus for QUAN data analysis, *statistics*. We must stop and examine this a bit more before we move on.

2.1.4 Statistics versus researcher sensitivity

Once quantitative researchers had gone down the ‘meaning in numbers’ path, a welcome bonus emerged. Mathematicians have found that if we have a sufficiently big sample size, the characteristics of the people in this group will approach a very special pattern termed ‘normal distribution’. This means that within the sample a few people will display very high values, a few others very low ones, with the bulk of the sample centred around the middle or average range. This is the all-important ‘bell-shaped curve’ (see Figure 2.1), and it has been found that the greater the sample, the more ‘normal’ the distribution and the more regular the curve becomes. (For more details, see Section

9.4.2.) What makes this bell-shaped curve so important is that it has unique properties upon which it is possible to build a whole range of mathematical procedures that have led to the development of 'statistics'.



Figure 2.1 The bell-shaped curve of normal distribution

Thus, adopting the 'meaning in numbers' approach has not only offered quantitative researchers a way out of the individual respondent variation dilemma mentioned above, but it has also provided an elaborate set of statistical analytical tools to use to add systematicity to the data analysis phase rather than having to rely on the researcher's subjective interpretations. Thus, quantitative research could eliminate individual variability both at the data collection and the data analysis stages. For many scholars, the major attraction of QUAN is this systematic, 'individual-proof' nature, governed by precise rules and regulations, thus approximating the regularity of the natural sciences.

In contrast, the 'meaning in the particular' approach of qualitative research has not offered any bonus gifts for the analysis phase of qualitative research. Consequently, although qualitative research also applies various data analytical procedures to make the investigations more rigorous and systematic, at the heart of any qualitative analysis is still the researcher's subjective sensitivity, training, and experience. Thus, while no one would deny that by using qualitative methods we can uncover subtle meanings that are inevitably lost in quantitative research, QUAL is linked to two basic sources of variation, associated with the individual respondents and the individual researcher. For many scholars the major attraction of QUAL is exactly this sensitivity to the individual, but we can perhaps start sensing at this point where some of the strong emotions characterizing the QUAL–QUAN debate originate: it is all too easy to present the above contrast as the antagonistic fight between 'callous' versus 'sensitive'; or 'systematic' versus 'fuzzy'; and ultimately, between 'objective' versus 'subjective'.

2.1.5 The QUAL–QUAN contrast and the 'paradigm war'

The inherent QUAL–QUAN differences led to conflicts, which escalated into a fully-fledged 'paradigm war' in the 1970s and 1980s. This clash was almost inevitable because by then all the components were in place for a proper show-down between the two methodological camps: the terms QUAL and QUAN were originally introduced to denote an antagonistic standpoint and, as we have seen in the previous sections, this initial conflicting stance was given substance by the contrasting patterns of the two research paradigms in:

- a *Categorizing the world* (QUAN: predetermined numerical category system; QUAL: emergent; flexible verbal coding).
- b *Perceiving individual diversity* (QUAN: using large samples to iron out any individual idiosyncrasies; QUAL: focusing on the unique meaning carried by individual organisms).
- c *Analysing data* (QUAN: relying on the formalized system of statistics; QUAL: relying on the researcher's individual sensitivity).

Quantitative research was seen to offer a structured and highly regulated way of achieving a *macro-perspective* of the overarching trends in the world, whereas qualitative research was perceived to represent a flexible and highly context-sensitive *micro-perspective* of the everyday realities of the world. In the paradigm war this distinction was extended to two different worldviews and the 'paradigm warriors' contested which level of analysis provided a more valid representation of human life and the social world in general. Many intellectually challenging position papers have been written about these different orientations, arguing that at the end of the day qualitative and quantitative research methodologies are rooted in two strikingly different paradigms and thus, by mixing them, we are likely to lose their very essence. The position I have taken in this book is that this view is incorrect.

2.1.6 Three positions regarding the QUAL–QUAN difference: purist, situationalist, and pragmatist

As we have seen in the previous section, taking theorizing to the level of abstraction of different worldviews, paradigms, and perspectives can logically lead to proposing what Rossman and Wilson (1985) called a 'purist' approach to research methodology, arguing that the qualitative and quantitative methodologies are mutually exclusive. Interestingly, although there is no shortage of convincing intellectual arguments to justify paradigm incompatibility, most researchers have actually stopped short of claiming the inevitability of this conflict and, particularly in the past decade, scholars have started to look for some sort of an interface between the two research traditions. Miles and Huberman (1994: 4–5), for example, pointed out that 'In epistemological debates it is tempting to operate at the poles. But in the actual practice of empirical research, we believe that all of us—realists, interpretivists, critical theorists—are closer to the centre, with multiple overlaps'.

Indeed, if we stop treating QUAL and QUAN research in a very general and contrasting manner and focus on the specific research issues at hand, we find that concrete research topics vary greatly in the extent to which they lend themselves to micro- or macro-level analysis. To take an example from my own research, the concept of 'demotivation' appears to be one where a micro-level qualitative investigation can be beneficial in uncovering the subtle personal processes whereby one's enthusiasm is gradually dampened

by a number of internal and external demotivating factors (Dörnyei 2001). On the other hand, the process of ‘language globalization’ can be investigated particularly well from a quantitative macro-perspective, determining for example how Global English impacts the acquisition and use of local languages in various speech communities (Dörnyei *et al.* 2006). This would suggest that both approaches have value if they are applied in the appropriate research context—a view that has been often referred to as the ‘situationalist’ approach to research methodology. (See Rossman and Wilson 1985.)

Although the situationalist view accepts the strengths of both research traditions, it still represents an ‘either/or’ approach. However, we do not necessarily have to stop here. While it is true that particular research questions or topics can be more naturally linked to either QUAL or QUAN methods, in most cases we can also look at the same research question from another angle, using the other approach, thus uncovering new aspects of the issue. For example, when considering student demotivation—which I suggested above can be successfully examined through a qualitative approach—we can also examine how extensive this problem is in our schools or how much impact it has on students’ learning achievement, and these questions can be best addressed through quantitative studies. And similarly, even broad trends such as language globalization can be investigated from a micro-perspective by analysing, for example, the day-to-day process whereby bilingual families in multicultural environments shift towards the use of one or the other language. This indicates that some sort of an integration of the two research methodologies can be beneficial to ‘corroborate (provide convergence in findings), elaborate (provide richness and detail), or initiate (offer new interpretations) findings from the other method’ (Rossman and Wilson 1985: 627). This is the *pragmatist* position underlying mixed methods research, and as stated in the Preface and Chapter 1, it is my personal belief that mixing methods has great potential in most research contexts.

2.2 Quantitative research

Let us set out on a more detailed examination of the three research approaches. The fact that I begin with the analysis of quantitative research is not to be taken as an indication of a hierarchical order. My reason is purely pragmatic: because qualitative research gained paradigmatic status as a reaction against quantitative research, it is practical to get to know quantitative research first, as a kind of baseline. I will follow this practice throughout the whole book.

2.2.1 Brief historical overview

Quantitative social research was originally inspired by the spectacular progress of the natural sciences in the nineteenth century and therefore early social researchers set out to adopt what was called the ‘scientific method’ in their investigations. This method had been evolving in western thinking since

about the mid-sixteenth century (the period of the Enlightenment) through the work of philosophers and scholars such as Copernicus, Bacon, Galilei, Kepler, Newton, Descartes, Hume, Comte, and Peirce. (For overviews, see Garratt and Li 2005; Jordan 2004.) Broadly speaking, the scientific method postulates three key stages in the research process: (a) observing a phenomenon or identifying a problem; (b) generating an initial hypothesis; and (c) testing the hypothesis by collecting and analysing empirical data using standardized procedures. Once the hypothesis has been successfully tested and further validated through replication, it becomes accepted as a scientific theory or law. Thus, the scientific method offered a tool to explore questions in an 'objective' manner, trying to minimize the influence of any researcher bias or prejudice, thereby resulting in what scholars believed was an accurate and reliable description of the world.

The scientific method was closely associated with numerical values and statistics, along the line of Nobel prize winner Lord Rutherford's famous maxim that any knowledge that one cannot measure numerically 'is a poor sort of knowledge'. Being a scientist was ultimately associated with empirically measuring one's subject matter and, preferably, conducting experiments. To serve the mathematical needs of the newly emerging social sciences, statistics became a fully-fledged subdiscipline of mathematics by the end of the nineteenth century. The contribution of one scholar in particular, Francis Galton, was significant in establishing quantitative data collection and analytical methods in psychology at the turn of the twentieth century: amongst other things, Galton initiated psychological testing, introduced the use of questionnaires and created the statistical concepts of regression and correlation.

The first half of the twentieth century saw major developments both in the scientific method (most notably through the work of Karl Popper) and in statistics (for example, by Spearman, Fisher, Neyman, and Pearson), leading to the increased use of quantitative methodology across the whole range of social disciplines. As a result of this progress, the social sciences achieved maturity and earned the reputation of being able to study human beings 'scientifically' both at the individual and the societal levels. Fuelled by the advances in psychometrics (a subdiscipline focusing on measurement in psychology), classical test theory, experimental design, survey research, questionnaire theory, and multivariate statistics, the middle of the twentieth century became dominated by quantitative methodology in the social sciences. This hegemony only started to change in the 1970s as a result of the challenges of qualitative research, leading to a restructuring of research methodology. Currently, in many areas of the social sciences we can see a peaceful coexistence of quantitative and qualitative methods.

In applied linguistics, according to Lazaraton (2005), the period between 1970–1985 saw a significant increase of quantitative research articles, which went hand in hand with the publication of several research methods texts in the 1980s, culminating in Hatch and Lazaraton's (1991) seminal *Research Manual*; this provided a very detailed summary of quantitative research and

statistics, richly illustrated with published quantitative studies. Lazaraton (2005) reports on a survey of 524 empirical studies that appeared in four major applied linguistic journals between 1991 and 2001; the results show that as many as 86 per cent of the research papers were quantitative (while 13 per cent qualitative and 1 per cent mixed methods), which led Lazaraton to conclude that quantitative studies 'reign supreme' (p. 219) in our field.

Lazaraton (2005) also highlighted a major change taking place in research orientation in applied linguistics: while in the 1980s there was an 'unquestioned reliance' on quasi-experimental studies, the past 15 years have brought along a broader, multidisciplinary perspective on research methodology, with an increasing number of alternative, often qualitative, designs employed. In an overview of research methods in the field, Duff (2002) also highlights the growing sophistication of quantitative studies in the 1990s, both in terms of their design and their psychometric refinement, which confirms Lazaraton's (2000) conclusion that there has been a 'coming of age' of quantitative research in applied linguistics.

2.2.2 Main characteristics of quantitative research

As we saw in the previous section, quantitative social research had grown out of the desire to emulate the 'objective' procedures in the natural sciences. However, along with many others, Shavelson and Towne (2002) point out that even though several aspects of the 'scientific method' appear to be transferable to social research, there are also some fundamental differences between the natural and social sciences. The most obvious of these is that, unlike atoms or molecules, people show variation over time and across social and cultural contexts. They also display within-individual variation and therefore even if they are placed under similar conditions, their reaction will vary widely, which is something natural scientists working with atoms and molecules do not have to worry about (Dörnyei 2005). Therefore, while quantitative methods in the social sciences by and large align with the general principles of the 'scientific method', they also show certain distinctive features.

Section 2.1 already listed some of the characteristic features of quantitative research. The following summary reiterates those and adds some further characteristics that have not been mentioned before.

- *Using numbers* The single most important feature of quantitative research is, naturally, that it is centred around numbers. This both opens up a range of possibilities and sets some limitations for researchers. Numbers are powerful, as attested to by the discipline of mathematics. Yet numbers are also rather powerless in themselves because in research contexts they do not mean anything without contextual 'backing': they are faceless and meaningless unless we specify exactly the category that we use the specific number for, and also the different values within the variable (i.e. knowing, what '1' or '6' means in a particular category). Thus, for numbers to work,

we need precise definitions of the content and the boundaries of the variables we use and we also need exact descriptors for the range of values that are allowed within the variable. However, if we manage to provide all this, numbers *do* work and the development of quantitative research over the last century has been frankly astounding. The level of sophistication that quantitative data analysis has reached is awesome in every sense of the word.

- *A priori categorization* Because the use of numbers already dominates the data collection phase, the work required to specify the categories and values needs to be done *prior* to the actual study. (See also Section 2.1.2.) If, for example, respondents are asked to encircle figures in a questionnaire item, they have to know exactly what those figures represent, and in order to make sure that each respondent gives their numerical answer based on the same understanding, the definitions and value descriptors need to be unambiguous. To achieve this takes time and effort, and although (as will be discussed later) most phases of qualitative research tend to be more labour-intensive than those of quantitative research, the preparation phase is an exception: whereas in a qualitative interview study one can start the first interview soon after the instigation of the project, in a quantitative study several weeks and often months of meticulous preparation and piloting are usually needed before the finalized instrument can be administered. Luckily, after the administration of the instrument, things speed up and even in a large-scale quantitative study it is not unheard of to have preliminary results within a week after the data has been collected. This would be impossible in qualitative research.
- *Variables rather than cases* As discussed in Section 2.1.3, quantitative researchers are less interested in individuals than in the common features of groups of people. Therefore, in contrast to the QUAL emphasis on the individual case, QUAN research is centred around the study of *variables* that capture these common features and which are quantified by counting, scaling, or by assigning values to categorical data. (See Sections 9.2.1 and 9.4.1.) All the various quantitative methods are aimed at identifying the relationships between variables by measuring them and often also manipulating them (as in experimental studies; see Section 5.3); Hammersley and Atkinson (1995) regard the quest for specifying the relationships amongst variables as the defining feature of quantitative social research.
- *Statistics and the language of statistics* Section 2.1.4 discussed the significance of statistics in quantitative research. This is undoubtedly the most salient QUAN feature—as we will see in Chapter 9, statistical analyses can range from calculating the average (or as it is referred to in statistics, the ‘mean’) of several figures on a pocket calculator to running complex multivariate analyses on a computer. Because of the close link of quantitative research and statistics, much of the statistical terminology has become part

of the QUAN vocabulary, and the resulting unique QUAN language adds further power to the quantitative paradigm. No wonder that qualitative researchers have gone to great lengths to try and replace some of the QUAN research terminology with QUAL-specific language (for example, when defining the QUAL quality criteria—see Section 3.1).

- *Standardized procedures to assess objective reality* Sections 2.1.3 and 2.1.4 highlighted the general QUAN aspiration of eliminating any individual-based subjectivity from the various phases of the research process by developing systematic canons and rules for every facet of data collection and analysis. Quantitative methodology has indeed gone a long way towards standardizing research procedures to ensure that they remain stable across investigators and subjects. This independence of idiosyncratic human variability and bias has been equated with ‘objectivity’ by quantitative researchers and the results accumulated through such procedures are thought to describe the objective reality that is ‘out there’, independent of the researcher’s subjective perceptions. Of course, as Bachman (2004a) points out, this stance is based on the assumption that there actually exists an objective reality, so that when different researchers observe the same phenomenon using standardized measures, their findings will show agreement and convergence.
- *Quest for generalizability and universal laws* Numbers, variables, standardized procedures, statistics, and scientific reasoning are all part of the ultimate QUAN quest for facts that are generalizable beyond the particular and add up to wide-ranging, ideally universal, laws. Whether such laws actually exist with regard to the social behaviour of humans, and if they do, how universal they are, are fundamental ideological questions that go beyond the scope of this book.

2.2.3 Strengths and weaknesses of quantitative research

The strengths of quantitative research are manifold and most have been discussed in the previous sections. QUAN proponents usually emphasize that at its best the quantitative inquiry is systematic, rigorous, focused, and tightly controlled, involving precise measurement and producing reliable and replicable data that is generalizable to other contexts. The statistical analytical apparatus is refined and far-reaching and it also offers some in-built quality checks and indices (such as statistical significance) that help readers to decide on the validity of quantitative findings. From a practical perspective, even with the longer preparation period discussed earlier, the research process is relatively quick and offers good value for money, particularly because the data analysis can be done using statistical computer software. Finally, quantitative findings tend to enjoy a universally high reputation with almost any audience or stakeholder group.

The downside of quantitative methods is that they average out responses across the whole observed group of participants, and by working with concepts of averages it is impossible to do justice to the subjective variety of an individual life. Similar scores can result from quite different underlying processes, and quantitative methods are generally not very sensitive in uncovering the reasons for particular observations or the dynamics underlying the examined situation or phenomenon. That is, the general exploratory capacity of quantitative research is rather limited. Because of these shortcomings, qualitative researchers often view quantitative research as 'overly simplistic, decontextualized, reductionist in terms of its generalizations, and failing to capture the meanings that actors attach to their lives and circumstances' (Brannen 2005: 7).

2.3 Qualitative research

Describing quantitative research has been a relatively straightforward task because there is a general agreement amongst QUAN practitioners about the main features and principles of the approach. This is not at all the case with QUAL research. In a recent overview of the field, two of the most influential qualitative researchers, Denzin and Lincoln (2005a), concluded that 'qualitative research is difficult to define clearly. It has no theory or paradigm that is distinctly its own. ... Nor does qualitative research have a distinct set of methods or practices that are entirely its own, (p. 6–7). And later they added, 'Qualitative research is many things to many people' (p. 10).

Denzin and Lincoln's view is not at all exaggerated and is shared throughout the profession. For example, another well-known proponent of qualitative research, Silverman (1997), expressed a similar conclusion when he stated that 'there is no agreed doctrine underlying all qualitative social research' (p. 14). Furthermore, Holliday (2004: 731) has added that 'boundaries in current qualitative research are crumbling, and researchers are increasingly doing whatever they can to find out what they want to know'. As seen earlier, the lack of uniformity goes back to the genesis of the qualitative approach when scholars of diverse beliefs united under the qualitative label in their fight against the quantitative paradigm.

Luckily, the overall picture is not as gloomy and fragmented as the above quotes would suggest. Qualitative research is in fact a thriving discipline, and while it is true that some issues have been subject to a lot of, and sometimes heated, discussion, there exists a core set of features that would universally characterize a properly conducted qualitative study. In the next sections we are going to look at these core attributes.

2.3.1 Brief historical overview

Research that can be considered 'qualitative' in retrospect has been around for about a century in the social sciences. Qualitative-like methods were

introduced into sociology at the end of the first decade of the twentieth century through the work of the Chicago School for the study of human group life, and during the first third of the century anthropology also produced some seminal qualitative studies by renowned scholars such as Boas and Malinowski, defining the outlines of the fieldwork method (Denzin and Lincoln 2005a). Thus, the basic QUAL ideas and principles are not new at all, yet the first text that tried to define 'qualitative methodology'—Glaser and Strauss's (1967) *The Discovery of Grounded Theory: Strategies for Qualitative Research*—did not appear until the late sixties. In this highly influential book the authors described the use of qualitative procedures by the QUAL pioneers as 'nonsystematic and nonrigorous' (p. 15), and contended that early monographs based on qualitative data consisted of 'lengthy, detailed descriptions which resulted in very small amounts of theory, if any' (ibid.).

After the 1930s and particularly after World War II, quantitative research methodology produced substantial advances (see Section 2.2.1) and qualitative research was relegated to preliminary, exploratory work whose role was seen to provide the 'more serious' quantitative studies with an adequate starting point. The middle of the twentieth century was undoubtedly dominated by quantitative research, and the invaluable merit of Glaser and Strauss's (1967) book was to offer a viable challenge to this hegemony. These authors were explicitly concerned with the 'systematization of the collection, coding and analysis of qualitative data for the generation of theory' (p. 18; see also the discussion of 'grounded theory' in Section 10.3), and for the first time, qualitatively inclined researchers had had an elaborate theoretically based methodology available to them. Qualitative research was on the march.

Recent years have seen an explosion of texts on qualitative methods reflecting a growing interest in the approach across all the disciplines of the social sciences. Seale *et al.* (2004), for example, examined the output of the main publisher of methodology texts, Sage Publications, and found that during the last decade there was a four-fold increase of published qualitative methods textbooks (N = 130+).

In applied linguistics there has been an increasing visibility and acceptance of qualitative research since the mid-1990s (Duff in press). This is related to the growing recognition that almost every aspect of language acquisition and use is determined or significantly shaped by social, cultural, and situational factors, and qualitative research is ideal for providing insights into such contextual conditions and influences. Accordingly, applied linguistics has been offering an increasingly level playing field for both QUAN and QUAL approaches. Having said that, we must also note a serious concern in this respect, highlighted by Lazaraton (2003), namely that there have been too few qualitative studies published in the leading applied linguistics journals, with the possible exception of *TESOL Quarterly*. For example, the editor of *The Modern Language Journal*, Sally Magnan (2000: 2), reported that although there had been an 'increase in ethnographic and case studies submitted for consideration, to the point that their numbers were beginning to approach

those of quantitative pieces', during the 1995–2005 period only 19.8 per cent of the research articles in her journal were qualitative (and 6.8 per cent used a mixed methodology) (Magnan 2006). It would be interesting to carry out a systematic analysis of the reasons for the discrepancy between the submission and the publication rates.

Although the frequency of published QUAL studies is still relatively low, the impact of qualitative research in applied linguistics over the past three decades has been profound. Early case studies of the 1970s and 1980s had a groundbreaking effect on our understanding of SLA and generated many of the prevailing principles and models. (See Section 6.7.3.) With regard to contemporary research, we find qualitative studies focusing on topics across the whole research spectrum, even including core quantitative areas such as language testing, and several key areas of applied linguistics (for example, the study of gender, race, ethnicity, and identity) are being driven by qualitative research. (For an overview of qualitative inquiry in applied linguistics, see Richards 2003.)

2.3.2 Main characteristics of qualitative research

The research methodology literature contains several detailed summaries of the core features of qualitative inquiry. Many of the points in the different lists overlap but, as mentioned earlier, there are also some contentious issues. Let us look at the most often mentioned aspects:

- *Emergent research design* In describing the main characteristics of qualitative research, most research texts start with highlighting its *emergent* nature. This means that no aspect of the research design is tightly prefigured and a study is kept open and fluid so that it can respond in a flexible way to new details or openings that may emerge during the process of investigation. This flexibility even applies to the research questions, which may evolve, change, or be refined during the study—see Section 3.3.2. An important aspect of this emergent nature is the fact that, ideally, qualitative researchers enter the research process with a completely open mind and without setting out to test preconceived hypotheses. This means that the research focus is narrowed down only gradually and the analytic categories/concepts are defined during, rather than prior to, the process of the research. For example, in their seminal work, Glaser and Strauss (1967) actively encouraged qualitative researchers to ignore the literature before the investigation in order to assure that 'the emergence of categories will not be contaminated by concepts more suited to different areas' (p. 37). This is a highly controversial issue and for this reason we come back to it in a separate section below.
- *The nature of qualitative data* Qualitative research works with a wide range of data including recorded interviews, various types of texts (for example, field notes, journal and diary entries, documents) and images (photos or

videos). During data processing most data are transformed into a textual form (for example, interview recordings are transcribed) because most qualitative data analysis is done with words—see Section 10.1.1. Although qualitative data is not gathered with the purpose of being directly counted or measured in an objective way, subsequent analysis can define categories through which certain aspects of qualitative data can be quantified—see Section 11.1.1. Because the common objective of all the different types of qualitative methods is to make sense of a set of (cultural or personal) meanings in the observed phenomena, it is indispensable that the data should capture rich and complex details. Therefore, in order to achieve such a ‘thick’ description, almost any relevant information can be admitted as QUAL data.

- *The characteristics of the research setting* Because of the QUAL objective to describe social phenomena as they occur naturally, qualitative research takes place in the *natural setting*, without any attempts to manipulate the situation under study. In order to capture a sufficient level of detail about the natural context, such investigations are usually conducted through an intense and prolonged contact with, or immersion in, the research setting.
- *Insider meaning* Qualitative research is concerned with subjective opinions, experiences and feelings of individuals and thus the explicit goal of research is to explore the participants’ views of the situation being studied. This approach follows from the way qualitative researchers perceive meaning: it is a fundamental QUAL principle that human behaviour is based upon meanings which people attribute to and bring to situations (Punch 2005) and it is only the actual participants themselves who can reveal the meanings and interpretations of their experiences and actions. Therefore, qualitative researchers strive to view social phenomena from the perspectives of the ‘insiders’ and the term ‘insider perspective’ has a special place in the qualitative credo.
- *Small sample size* Well-conducted qualitative research is very labour-intensive and therefore qualitative studies typically use, of necessity, much smaller samples of participants than quantitative ones. We will come back to the question of qualitative sampling in Chapter 6 (Section 6.2).
- *Interpretive analysis* Qualitative research is fundamentally interpretive, which means that the research outcome is ultimately the product of the researcher’s subjective interpretation of the data. Several alternative interpretations are possible for each dataset, and because QUAL studies utilize relatively limited standardized instrumentation or analytical procedures, in the end it is the researcher who will choose from them. As Miles and Huberman (1994: 7) conclude, ‘The researcher is essentially the main “measurement device” in the study’. Accordingly, in qualitative research, the researcher’s own values, personal history, and ‘position’ on characteristics such as gender, culture, class, and age become integral part of the inquiry (Haverkamp 2005).

The emergent/non-emergent debate

One of the most contentious issues amongst qualitative researchers concerns the question as to whether investigators need to enter a QUAL project with only minimal background knowledge so as not to 'contaminate' the emergent nature of the study. As quoted earlier, Glaser and Strauss (1967) were explicit about this requirement and it has 'become one of the main tenets of the qualitative inquiry that the results 'emerge' naturally, without any biased interference of the researcher. The researcher, therefore, needs to adopt a 'tabula rasa' orientation and Glaser and Strauss proposed that the researcher's 'theoretical sensitivity' is only to appear when the data has already been collected and partially analysed so that the concepts and hypotheses that have emerged from the data can be combined with existing knowledge.

Several scholars have questioned the reality of this prerequisite. Tashakkori and Teddlie (2003b), for example, pointed out that few social scientists would conduct unplanned and unstructured research, with no orientation or point of view to guide them. To the contrary, most established social researchers have extensive backgrounds in the areas that they are studying and therefore the 'tabula rasa' assumption is simply 'naïve' (p. 66). Miles and Huberman (1994) go one step further when they claim that it is the researchers' background knowledge that helps them to see and decipher details, complexities, and subtleties, as well as to decide what kind of questions to ask or which incidents to attend to closely. As they conclude, not to be led by one's conceptual strengths can be self-defeating, which is in contrast with Glaser and Strauss's (1967) warning that if scholars commit themselves exclusively to one specific preconceived theory they become 'doctrinaire'.

2.3.3 Strengths and weaknesses of qualitative research

There is no shortage in the literature of elaborate descriptions of the merits of qualitative research, and I have found the following points particularly significant:

- *Exploratory nature* Qualitative research has traditionally been seen as an effective way of exploring new, uncharted areas. If very little is known about a phenomenon, the detailed study of a few cases is particularly appropriate because it does not rely on previous literature or prior empirical findings (Eisenhardt 1989).
- *Making sense of complexity* Qualitative methods are useful for making sense of highly complex situations. In such cases there is a real danger for researchers in general to produce reduced and simplified interpretations that distort the bigger picture; the participant-sensitivity of qualitative research is very helpful in deciding what aspects of the data require special attention because it offers priority guidelines that are validated by the main actors themselves. That is, the groundedness of qualitative research helps to distinguish real phenomena from intellectual fabrications.

- *Answering 'why' questions* It is not uncommon in quantitative studies to obtain surprising or contradictory results, but in many of these cases the collected data does not offer any real enlightenment as to the causes. This is when researchers include at the end of the research report the well-known statement 'further research is needed to understand ...' (meaning, 'we have no idea why this has occurred ...'). In contrast, the flexible, emergent nature of a qualitative study allows the researcher to conduct the 'further research' straight away, thereby reaching a fuller understanding.
- *Broadening our understanding* Talking about the issue of generalizability in qualitative research, Duff (in press) emphasizes that instead of seeking a generalizable 'correct interpretation', qualitative research aims to broaden the repertoire of *possible interpretations* of human experience. Thus, the rich data obtained about the participants' experience can widen the scope of our understanding and can add data-driven (rather than speculative) depth to the analysis of a phenomenon.
- *Longitudinal examination of dynamic phenomena* Interestingly, one of the main reasons why I have come to appreciate and use qualitative research is rarely mentioned in the literature. I have found that qualitative research is particularly useful for the purpose of longitudinal research. As argued in Chapter 4 (Section 4.2), most of the processes studied by applied linguists are dynamic in nature, and therefore we would need many more longitudinal investigations in the field to explore the sequential patterns and the changes that occur. Qualitative research offers a good starting point in this respect.
- *Flexibility when things go wrong* There is a host of things that can go wrong while doing research in the field, particularly if the research site is within an educational institution. (See Section 8.4 for the various challenges of classroom research.) If we use a purely quantitative research design, some of the unexpected events can render our study meaningless, whereas qualitative methods not only allow us to accommodate the changes but can also enable us to capitalize on them and produce exciting results. Gherardi and Turner (1999) report on a study by Lowe, which examined a series of QUAN investigations carried out by various distinguished scholars. It was found that, with one exception, all the projects reached a point of disruption when the original plan broke down, requiring activities of theoretical 'patchworking' in order to repair the breakdown and to present an appearance of coherence in the work. Gherardi and Turner concluded that if research is recognized to be a journey into the unknown (i.e. QUAL) rather than a task which can be fully specified and planned in advance (i.e. QUAN), then such breakdowns look less surprising and can be handled within the research framework.
- *Rich material for the research report* One disheartening aspect of quantitative studies can be when the results of several months of hard labour

are summarized in one or two small tables (of correlations, for example). Gillham (2000) describes this situation well: 'If the basic research questions are complex (when are they not?) then your data are going to look pretty thin and superficial' (p. 121). In contrast, qualitative accounts that use the words and categories of the participants make it much easier to produce a convincing and vivid case for a wide range of audiences.

Weaknesses

In the literature we usually find two types of criticisms of qualitative research. The first consists of quantitatively motivated complaints about certain aspects of qualitative research that are different from quantitative research but which qualitative researchers consider either a strength or a normal feature. The second contains issues raised by qualitative researchers themselves. Let us look at five particularly salient issues:

- *Sample size and generalizability* The most frequent criticism offered by quantitatively minded researchers concerns the idiosyncratic nature of the small participant samples that most qualitative studies investigate. This question was already discussed in Section 2.1.3, where I argued that the two paradigms approach the question of generalizability differently. However, even if we accept that the exploration of personal meaning does not require large samples, Duff (2006) warns us that although the common QUAL practice of examining 'telling' cases may be very helpful in providing insights into a phenomenon, the specific conditions or insights may not apply broadly to others. Yates (2003: 224) calls this issue the 'potential over-reading' of the individual stories.
- *Researcher role* Another contested issue concerns the role played by the researcher in analysing the data. As Miles and Huberman (1994: 10) put it, 'The strengths of qualitative data rest very centrally on the competence with which their analysis is carried out'. Quantitative researchers would like to see some firm safeguards to make sure that results are not influenced by the researcher's personal biases and idiosyncrasies. (For more details, see Section 3.1 on quality criteria.)
- *Lack of methodological rigour* For quantitative researchers, who are used to standardized instruments and procedures and statistical analytical techniques, qualitative research can easily appear unprincipled and 'fuzzy'. It is noteworthy that similar points are also made within the qualitative camp. For example, a group of respected qualitative scholars, Seale *et al.* (2004: 2), argued against the postmodern position within the QUAL movement as follows:

These appear to be driven by an anti-methodological tenor that prefers the substance (research topics) to the form (methodology). Such a perspective, born partly in reaction to positivism, waved a flag of the superiority of qualitative research to surveys and experiments and

considered methodological principles incapable of achieving a deeper understanding of a fragmented and dislocated culture. However, this research style has not always maintained its promise of achieving a deeper kind of research. The consequences are too often exposed to view: low quality qualitative research and research results that are quite stereotypical and close to common sense.

We must note, though, that these comments about a lack of methodological rigour only apply to some qualitative strands because the past two decades have seen a marked shift towards applying rigorous procedures in QUAL studies.

- *Too complex or too narrow theories* Because qualitative researchers have no real means of assessing which of their findings are of more general importance and which are simply idiosyncratic to a particular case, even QUAL scholars (for example, Eisenhardt 1989) point out that there is a real danger of building too narrow theories from the individual cases studied. In a similar way, the intensive use of rich data can also yield a theory which is overly complex.
- *Time consuming and labour-intensive* A final point, which both QUAL and QUAN scholars would agree on, is that QUAL research, particularly the processing of QUAL data, can be rather time-consuming, more so than QUAN research—as mentioned earlier, it is partly this feature which explains the relatively small sample sizes used in QUAL inquiries.

2.4 Mixed methods research

Researchers have been referring to studies that combine qualitative and quantitative methods under a variety of names, such as multitrait-multimethod research, interrelating qualitative and quantitative data, methodological triangulation, multimethodological research, mixed model studies, and mixed methods research (Creswell *et al.* 2003)—as indicated by the title of the recent *Handbook of Mixed Methods Research*, the field appears to have settled with the last term: Over the past 15 years, mixed methods research has been increasingly seen as a third approach in research methodology. The method has been endorsed by some of the most influential methodologists in the social sciences. Miles and Huberman (1994: 310) summarized the new emerging *Zeitgeist* well:

Entertain mixed models. We have sought to make a virtue of avoiding polarization, polemics, and life at the extremes. Quantitative and qualitative inquiry can support and inform each other. Narratives and variable-driven analyses need to interpenetrate and inform each other. Realists, idealists, and critical theorists can do better by incorporating other ideas than by remaining pure. Think of it as hybrid vigour.

Let me cite one more illustrative extract from Strauss and Corbin's (1998: 34) book:

Qualitative and quantitative forms of research both have roles to play in theorising. The issue is not whether to use one form or another but rather how these might work together to foster the development of theory. Although most researchers tend to use qualitative and quantitative methods in supplementary or complementary forms, what we are advocating is a true interplay between the two. The qualitative should direct the quantitative and the quantitative feedback into the qualitative in a circular, but at the same time evolving, process with each method contributing to the theory in ways that only each can.

Let us now examine where the idea of mixing methodologies has come from and what its main principles are.

2.4.1 Brief historical overview

The practice of collecting multiple data types dates back to the earliest social science research at the beginning of the twentieth century, and as Maxwell and Loomis (2003) point out, the practice of mixing very different research approaches—for example naturalistic, contextualized and inductive approaches with experimental manipulation and theory verification—has an even longer history in disciplines such as ethology and animal behaviour, palaeontology and geology. Yet, similarly to qualitative research, an explicit discussion of mixing methodologies had to wait until the second half of the twentieth century, for Campbell and Fiske's (1959) promotion of multitrait-multimethod research as a way of validating research designs by separating trait and method effects. Although Campbell and Fiske focused on collecting multiple types of quantitative data only, their work was instrumental in generally encouraging the use of multiple methods and the collection of multiple forms of data in a single study (Hanson *et al.* 2005).

The real breakthrough in combining qualitative and quantitative research occurred in the 1970s with the introduction of the concept of 'triangulation' into the social sciences. The term was borrowed from naval navigation and land surveying, where it refers to a method for determining the yet unknown position of a certain spatial point through measurement operations from two known points (Erzberger and Kelle 2003), but in social research it became synonymous with combining data sources to study the same social phenomenon. In his famous monograph *The Research Act*, Denzin (1978) advocated triangulation as a way of validating hypotheses by examining them through multiple methods. Although Denzin referred primarily to multiple qualitative methods, he formulated what became the key tenet of mixed methods research, namely that methodological triangulation can help to reduce the inherent weaknesses of individual methods by offsetting them by the strength of another, thereby maximizing both the internal and the external validity

of research. (These terms will be further discussed in Section 3.1.1.) For example, Brewer and Hunter (1989: 11) introduced their pioneering book on *Multimethod Research* as follows:

The social sciences are well known for disputes between proponents of different methods, or styles, of research. In a sense, these methodological debates are a healthy sign. Scepticism is an essential part of scientific inquiry, and different types of methods represent important critical perspectives. Equally important, however, is the fact that different research methods offer possible solutions for one another's problems. This is the central premise of this book.

After the paradigm war had lost its edge in the 1990s and mixed methods researchers gained ideological confidence by drawing on the philosophy of pragmatism (see for example, Cherryholmes 1992), research methodology texts started to include chapters on combined, integrated or mixed methods (one particularly influential work from the time being Creswell 1994). Following this growing momentum, two high profile publications by Tashakkori and Teddlie (1998, 2003a) finally established mixed methods research as a legitimate form of inquiry in the social sciences.

In applied linguistics we find many studies that have combined methodologies; Magnan (2006), for example, reports that over the 1995–2005 period 6.8 per cent of the research papers appearing in *The Modern Language Journal* used mixed methods, which is relatively high if we compare it to the total number of qualitative studies (19.8 per cent). However, we must note that most studies in which some sort of method mixing has taken place have not actually foregrounded the mixed methods approach and hardly any published papers have treated mixed methodology in a principled way. Currently, there is a general call on the part of applied linguists of both QUAL and QUAN orientation for more engagement in this practice, and Lazaraton's (2005: 219) conclusion can be seen as representative: 'I would also hope that we would see more studies that combine qualitative and quantitative research methods, since each highlights "reality" in a different, yet complementary, way'.

2.4.2 Main characteristics of mixed methods research

A straightforward way of describing mixed methods research is to define it as some sort of a combination of qualitative and quantitative methods within a single research project. These two approaches have already been described separately above and so there is no need to reiterate their main features; the real issue in mixed methods research concerns *how* the QUAL–QUAN combination takes place, and scholars have proposed several viable design options in the literature. These are discussed in Chapter 7 in detail; as a preliminary, let me say that the variety of possible combinations is rich, going well beyond simple sequential arrangements (i.e. a research phase is followed by a second phase

representing the other approach). Furthermore, qualitative and quantitative principles can also be combined at the data analysis stage by ‘quantifying’ or ‘qualitizing’ the data. (See Section 11.1 on data transformation.)

2.4.3 Strengths and weaknesses of mixed methods research

As a result of the growing popularity of mixed methods research, several arguments have been put forward about the value of mixing methods. Let us have a look at the most important ones.

- *Increasing the strengths while eliminating the weaknesses* The main attraction of mixed methods research has been the fact that by using both QUAL and QUAN approaches researchers can bring out the best of both paradigms, thereby combining quantitative and qualitative research strengths (listed in Sections 2.2.3 and 2.3.3). This is further augmented by the potential that the strengths of one method can be utilized to overcome the weaknesses of another method used in the study. For example, as mentioned earlier, QUAN researchers have seen QUAL research as being too context-specific and employing unrepresentative samples—in a mixed methods study the sampling bias can be cancelled out if the selection of the qualitative participants is based on the results of an initial representative survey. (See Section 7.3 on the main types of mixed methods design.) On the other hand, QUAL researchers usually view QUAN research as overly simplistic, decontextualized and reductionist in terms of its generalizations, failing to capture the meanings that actors attach to their lives and circumstances (Brannen 2005)—in a mixed methods study a QUAN phase can be followed by a QUAL component to neutralize this issue by adding depth to the quantitative results and thereby putting flesh on the bones.
- *Multi-level analysis of complex issues* It has been suggested by many that we can gain a better understanding of a complex phenomenon by converging numeric trends from quantitative data and specific details from qualitative data. Words can be used to add meaning to numbers and numbers can be used to add precision to words. It is easy to think of situations in applied linguistics when we are interested at the same time in both the exact nature (i.e. QUAL) and the distribution (i.e. QUAN) of a phenomenon (for example, why do some teenage boys consider modern language learning ‘girlish’ and how extensive is this perception?). Mixed methods research is particularly appropriate for such multi-level analyses because it allows investigators to obtain data about both the individual and the broader societal context.
- *Improved validity* Mixed methods research has a unique potential to produce evidence for the validity of research outcomes through the convergence and corroboration of the findings. (See Chapter 3 for a detailed discussion of research validity.) Indeed, improving the validity of research has been at the heart of the notion of triangulation ever since its introduction in

the 1970s. Corresponding evidence obtained through multiple methods can also increase the generalizability—that is, external validity—of the results.

- *Reaching multiple audiences* A welcome benefit of combining QUAL and QUAN methods is that the final results are usually acceptable for a larger audience than those of a monomethod study would be. A well-executed mixed methods study has multiple selling points and can offer something to everybody, regardless of the paradigmatic orientation of the person. Of course, there is also the danger that the study might fall through the ‘paradigmatic crack’ and alienate everybody, but in the current supportive climate this is less likely.

Weaknesses

Mixing qualitative and quantitative methods has come to be seen by many as a forward-pointing and potentially enriching approach, but as Mason (2006) cautions us, the reasoning or logic behind such an assumption is not always as readily expressed as is the sentiment itself. Hesse-Biber and Leavy (2006) go even further when they suggest that the popular belief that the sum may be greater than its parts is not necessarily true. They cite an interview with Janice Morse, who warns about the danger of using mixed methods research as a ‘substitute for sharp conceptual thinking and insightful analyses’ (p. 334). Indeed, it would be clearly counterproductive to adopt a strategy whereby ‘when in doubt, mix methods ...’.

Hesse-Biber and Leavy (2006) also raise the issue of how well-versed any given researcher can be in both types of methodology, which leads to a critical question: Can more harm than good be done when researchers are not adequately trained in both methods? This is a realistic danger because the vast majority of researchers lack methodological skills to handle both QUAL and QUAN data. And even if we can expect this situation to improve with the growing awareness of mixed methods research, the question still remains: Apart from a relatively small number of unique, methodologically ambidextrous specimen, can we assume that the vision of a multimethodologically savvy new breed of researchers is realistic?

Finally, Maxwell and Loomis (2003) highlight a further issue, the diversity of the possible combinations of different methods, which is, as the scholars argue, far greater than any typology can adequately encompass. One cannot help wondering whether there is really a principled approach to guiding the variety of combinations so that we do not end up with an ‘anything goes as long as you mix them’ mentality. We will come back to this question of ‘principled mixing’ later in this book (in Section 3.1.3 and Chapter 7).

2.5 My own paradigmatic stance

In accordance with my overall beliefs about research methodology, I try to assume a genuinely unbiased position throughout this book with regard to paradigmatic preferences, emphasizing wherever possible positive aspects and potentials. However, I feel that it is necessary at this point to be a bit more specific about my own background and research orientation.

As already mentioned in the Preface, most colleagues would probably consider me a quantitative researcher because my best-known studies involve the use of research methods associated with quantitative social psychology (attitude/motivation surveys in particular). Indeed, I do appreciate the elaborate technical apparatus involved in quantitative research and I actually like statistics. At the same time, I have also experienced again and again how much richer data we can obtain in a well-conducted and analysed qualitative study than even in a large-scale questionnaire survey. Thus, starting in the mid-1990s, I began to include qualitative components in my research and I have learnt much from the qualitative data my associates and I have collected and analysed over the years.

I do accept that certain issues are best researched using either QUAL or QUAN methods but I have also come to believe that in most cases a mixed methods approach can offer additional benefits for the understanding of the phenomenon in question. Therefore, at the end of the research methodology chapter of a book I have written on L2 motivation (Dörnyei 2001), I included a concluding section called 'Towards a combined use of quantitative and qualitative studies', and over the past decade I have encouraged most of my PhD students to try and integrate QUAL and QUAN methods (investigating a range of topics from acculturation to teacher motivation). Although the generally high quality research findings my students produced have confirmed to me the viability of this approach, I am aware of the fact that most scholars are more naturally inclined towards either QUAL or QUAN research (see Section 14.5 on personal considerations in method selection), a fact that I suspect has to do with our cognitive styles. Therefore, in conducting mixed methods studies I seek to cooperate with researchers who have a qualitative orientation to complement my quantitative background.