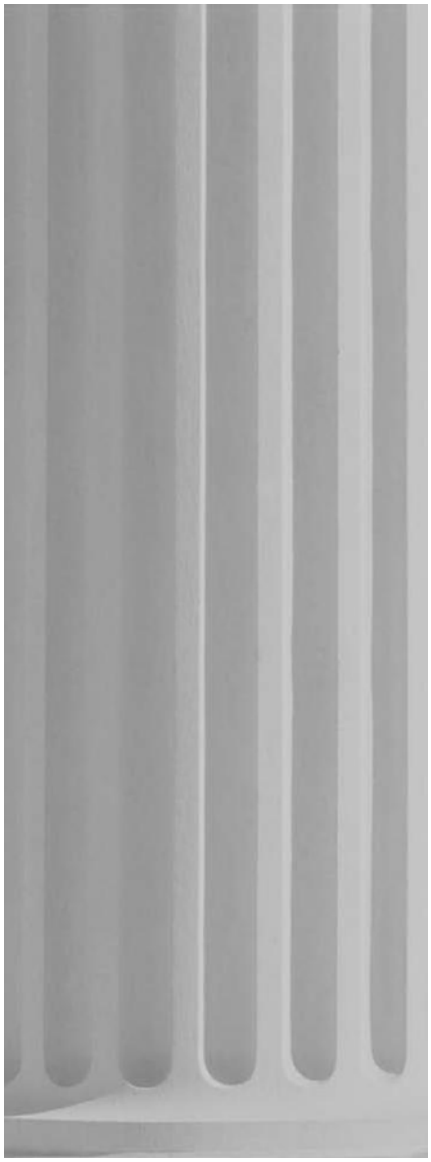
CHAPTER 13

Qualitative and Mixed Methods Analysis

KEY TERMS

constant comparison
content analysis
data reduction
grounded theory
open-coding
theoretical saturation



OUTLINE

data reduction
The systematic process undertaken to convert a set of raw data to a coded or summary form.

In general terms, the goal of any analysis is to answer the research question by some sequence of data processing steps (usually some form of **data reduction**) and inference. By data reduction, I mean the translation of raw data into a form that represents the original data in summary, indexed, graphic, or other coded form. In qualitative analysis, just as in quantitative analysis, the data processing and analysis strategies chosen should be a function of the original purpose of the study as well as the nature of the data. Several systematic approaches to qualitative and mixed methods data analysis have been developed, and new variations are regularly introduced and adapted to particular study goals and contexts. But it is unlikely that you will ever see a "qualitative cookbook" that provides you with probabilistic looking procedures and formulas (Eisner, 1991).

In their introduction to the first textbook on qualitative data analysis, Miles and Huberman (1984) noted that in attempting to provide a comprehensive guide to analysis of qualitative data, they invented or reinvented most of the methods in the book. They reported that doing so was a straightforward and enjoyable process, and predicted that the future of qualitative analysis would include such an "inventive, method-creating stance" (p. 17). The intervening years have shown that their prediction has been largely accurate, as evidenced by the second edition of their text (1994) as well as the diversity of methods and gradual acceptance by more academic journals and granting agencies in more recent years.

In conducting qualitative analysis, a creative investigative mind-set based in a responsible, ethically enlightened, participant-in-context-respecting attitude, is as necessary as an explicit set of analytic strategies. Such an attitude is difficult to learn from a textbook but can probably become well established through a combination of study and practice in the company of like-minded scholars, ideally a qualitative or mixed methods research team.

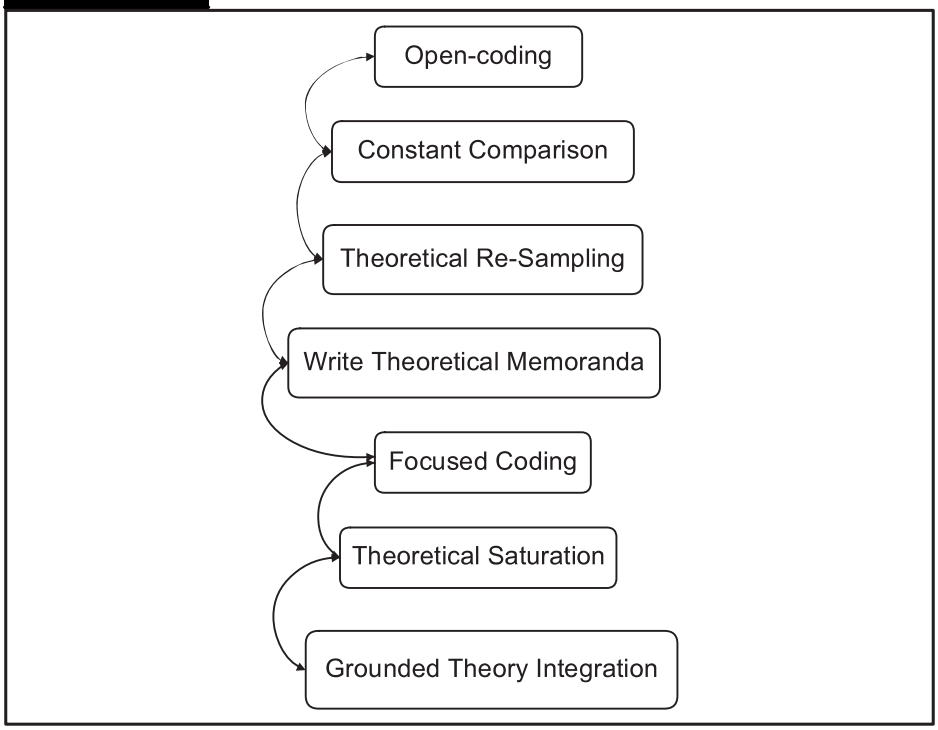
This chapter will provide an overview of some of the more classic methods as well as an introduction to some of the ways that computing has enhanced the range of possibilities for qualitative analysis. The examples in this chapter are only a brief and inadequate introduction to the richness of qualitative and mixed methods analysis and further reading is highly recommended.

13-1 Grounded Theory

grounded theory
A theory rooted in observation about phenomena of interest. Also, a method for achieving such a theory.

As noted in the discussion of qualitative design in Chapter 8, analysis from a **grounded theory** perspective is an iterative process directed toward the development of a theory describing or explaining a phenomenon of interest. The method was first used by Glaser and Strauss in their 1965 book *Awareness of Dying*, a landmark study both because of its subject matter and its methods. In this study, the researchers used a natural field setting to observe how situational conditions, particularly variations in level of patient awareness of likely mortality, influenced the experience of dying. In the process, they developed what later became known as the *method of constant comparative analysis* (Glaser & Strauss, 1967). Constant comparative analysis includes a relatively well-defined set of activities for studying the qualitative dataset resulting from observations, interviews, or other methods generating narratives. The data is usually studied in transcript form obtained from video or audio recordings. New methods of computerized analysis are making the study of

FIGURE 13–1 **Grounded theory analysis (constant comparison)**



original audio and video clips more practical and these will likely become more common in grounded theory and other qualitative studies.

In Figure 13–1, the typical steps in a grounded theory analysis are shown. The data may originate from any of the qualitative measurement strategies described in Chapter 6, including interviews, focus groups, narratives, video or audio recordings, or other qualitative or unobtrusive methods. The steps are shown to connect with double-headed arrows, intended to indicate that the phases are dynamic and that moving back and forth is acceptable and common practice.

Open-coding refers to the analyst's attempt to review the raw data and identify key aspects that can be used as an index or code in relating a particular passage to other facets of the dataset. Or, in less academic terms, open coding involves making up categories that you can assign chunks of text to. The coding is considered "open" in that the process involves discovery. In contrast, you can think of a codebook for a quantitative analysis as a kind of closed coding system because all variables and values are specifically defined.

open-coding
A phase of the grounded theory method where you consider the data in minute detail while developing some initial categories.

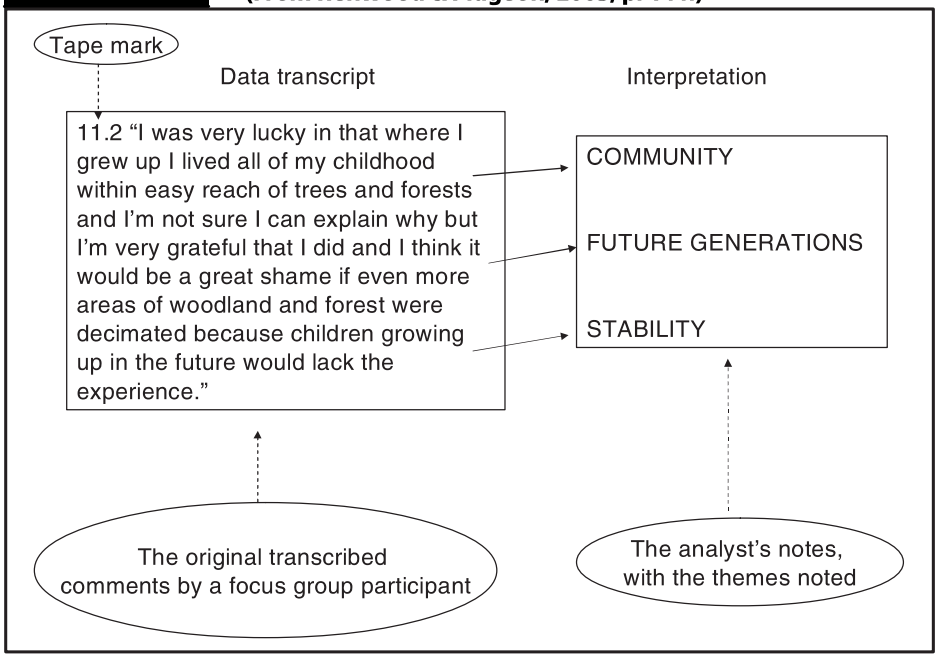
The **constant comparison** process involves the continuous sorting and contrasting of the elements of the dataset. The elements may include comments of participants, variations of higher-order concepts, and tentative theoretical propositions. The constant comparison process may occur at any point in the data collection and analysis and may stimulate particular kinds of inquiries during the study that add to the data and further stimulate the comparison process. The back-and-forth process often includes returning to the original participants to confirm the accuracy of the interpretation of the data.

constant comparison
The iterative and sequential process used when analyzing qualitative data that involves refinement of categories and interpretations based on increasing depth of understanding.

The analysis continues to a point referred to as **theoretical saturation**. This is the point where the analyst recognizes redundancy in the constant comparison process and where new data no longer stimulates revision of the conceptual framework. Practical limits are often imposed on the analysis as well. Sometimes access is limited to participants and settings. Nearly always, time and money will be finite. The context of the analysis is usually reported, including the researcher's sense of how the study results may have been limited by practical contingencies.

theoretical saturation
The point at which the analyst or analysts agree that new data no longer adds new meaning. The analysis is then saturated in the sense that it is complete and sufficient.

FIGURE 13–2 **Example of open-coding of transcript data. (From Henwood & Pidgeon, 2003, p. 144.)**



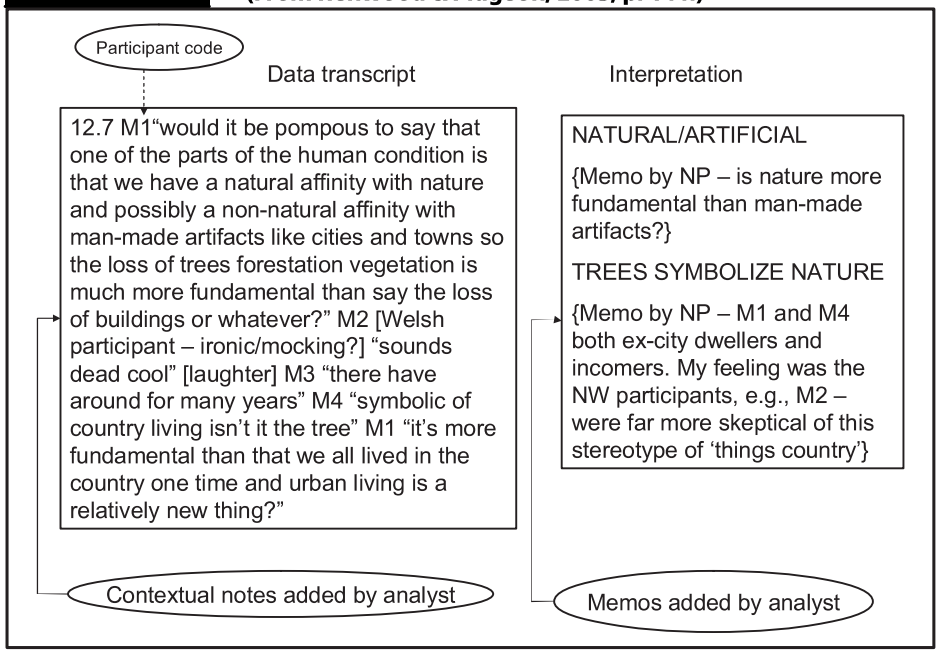
Henwood and Pidgeon (2003) illustrated the use of grounded theory with a study they conducted on personal significance of trees, woods, and forests among the residents of northern Wales. Their study will be described here to provide a sense of the big picture in grounded theory analysis as well as some insight into specific steps in such an analysis and how investigators adapt them to their own needs and preferences.

In this study, the data were generated in focus groups. The focus group participants were asked to talk about the personal and cultural significance of woodlands (for example, "What specific meanings attached to forests, woods, and trees in discussions of their cultural role and significance?") (p. 142). The goal of the study was to add another level of meaning to policy discussions of environmental issues that had typically been largely restricted to economic analyses.

The focus groups were audio-recorded. The analysis began when the investigators listened to all recordings independently and jointly. They then proceeded with development of transcripts and open-coding of comments. In this study, the authors found that they could make the coding process more efficient by transcribing specific parts of the discussion rather than the entire sessions as their analysis proceeded. This procedure illustrates the flexibility that tends to come with qualitative analysis, and it also shows the importance of reporting on procedures and the thinking that may have influenced judgments about procedures. In this case, the authors noted that the partial transcript allowed them to meet deadlines by saving time that would have been needed for transcribing the entire group discussion. They also noted that the process of listening to tapes separately and together was helpful. And they recommended doing one's own transcription as "a way for researchers to start early on the path of thinking analytically about the data and its properties" (p. 142).

A sample of transcript contents and coding from this study is shown in Figure 13–2. On the left side of the figure you see the verbatim comment of a participant, beginning with a notation as to the point in the tape where the comment was made. Then in the box on the right, three themes are noted. This example shows how coding of a simple and uninterrupted passage can be accomplished. In Figure 13–3, a more complex example from the same study is shown.

FIGURE 13–3 **Example of more complex coding of transcript data. (From Henwood & Pidgeon, 2003, p. 144.)**



In Figure 13–3, we see how the analysts handled what appears to be a quick back-and-forth discussion along with some significant notes about the tone of the comments as well as information about the background of the participants. The analysts' notes reveal the beginning of a theoretical theme regarding the importance of "insider" and "outsider" perspectives. The authors reported that this was an unanticipated discovery that led to thinking about the implications of labeling participants in these terms as well as sensitivity to some political attitudes possibly underlying the comments of participants. The analysts' memos also serve the important function of documenting the thought process that influenced the coding and interpretation of data.

Once the transcripts had been reviewed and the initial open-coding completed, a sequence of analyses that represent the process of constant comparison was initiated in order to identify higher-order concepts. The constant comparison involved review and discussion across and within sessions in order to develop theoretical hunches that could be further pursued. In most studies, this includes returning to the participants with new questions based on the accumulated understanding. The questions become increasingly differentiated as the theoretical understanding evolves. This is one of the defining features and advantages of the approach, and it is why such analysis can rightly be labeled "rich". In the Henwood and Pidgeon analysis, the next steps included developing themes based on the codes and verbatim excerpts as well as keeping track of the contribution of each to study conclusions. An example of the correspondence of higher-order themes, raw data, and study conclusions from Henwood and Pidgeon's study is shown in Table 13–1. This table is consistent with the dynamic nature of constant comparison in that a relationship between participant report and analyst interpretation is evident. They employed additional analytic steps and later collected additional data from other locations to examine geographic variation in attitudes and values.

As the authors noted, their study should not be considered the model for all grounded theory inquiry, but it does illustrate the basic approach. The ongoing discussions about the purpose and procedures of grounded theory make it unlikely that any particular study will satisfy all points of view on best practices in grounded theory analysis.

TABLE 13–1 **Grounded Theory Example of Correspondence of Themes, Data, and Study Conclusions**

Higher-Order Theme	Original Illustrative Data from Transcripts	Study Conclusion
Protection of wildlife/ biodiversity	"trees belong to the earth they belong to the animals . . . a lot of humans treat them in a way they shouldn't . . . they are supposed to be there just for a home and for food (for the animals)"	"Valuing woods and trees as wildlife habitats often simultaneously expressed older style conservationist beliefs and more recent environmental discourses; a dislike of human domination of nature is often featured, but this dislike is countered by fears of the chaotic potential of nature and a more modern (sometimes entrepreneurial) tolerance of the blurring of the boundaries between nature, human intervention, and culture."

Excerpt from table by Henwood & Pidgeon, 2003, p. 147.

13-2 Content Analysis

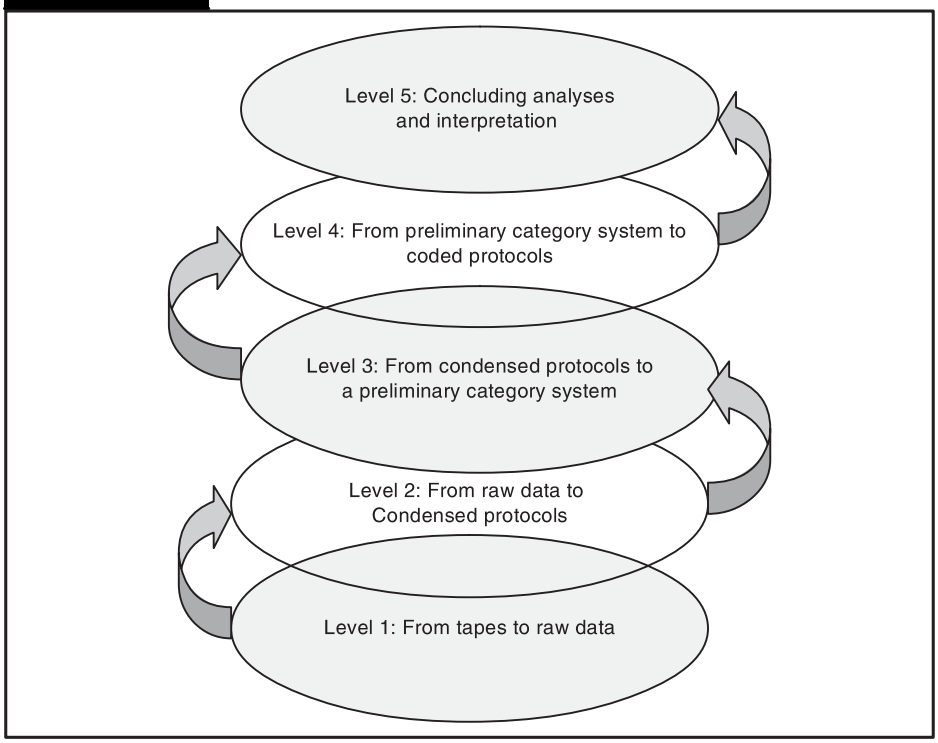
content analysis
The analysis of text documents. The analysis can be quantitative, qualitative, or both. Typically, the major purpose of content analysis is to identify patterns in text.

Content analysis is an extremely broad area of research. Content analysis is the systematic analysis of text (Krippendorff, 2004). The analysis can be quantitative, qualitative, or both. Typically, the major purpose of content analysis is to identify patterns in text. In Chapter 8, you read about the Hsieh and Shannon's (2005) distinctions in various purposes of content analysis (that is, conventional, directed, and summative content analysis).

Content analysis typically includes several important steps or phases. First, when there are many texts to analyze (for example, newspaper stories, organizational reports), the researcher often has to begin by sampling from the population of potential texts to select the ones that will be used. Second, the researcher usually needs to identify and apply the rules that are used to divide each text into segments or "chunks" that will be treated as separate units of analysis in the study, a process referred to as *unitizing*. For instance, you might extract each identifiable assertion from a longer interview transcript. Third, the content analyst constructs and applies one or more codes to each unitized text segment, a process called *coding*. The development of a coding scheme is based on the themes that you are searching for or uncover as you classify the text. Finally, you analyze the coded data, very often both quantitatively and qualitatively, to determine which themes occur most frequently, in what contexts, and how they might be correlated.

Content analysis has several potential limitations that you should keep in mind. First, you are limited to the types of information available in text form. If you were studying the way a news story is being handled by the news media, you probably would have a ready population of news stories from which you could sample. However, if you are interested in studying people's views on capital punishment, you are less likely to find an archive of text documents that would be appropriate. Second, you have to be especially careful with sampling to avoid bias. For instance, a study of current research on methods of treatment for cancer might use the published research literature as the population. This would leave out both the writing on cancer that was not published for one reason or another (publication bias), as well as the most recent work that has not yet been published. Finally, you have to be

FIGURE 13–4 **Schilling's (2006) qualitative content analysis spiral**



careful about interpreting results of automated context analyses. A computer program cannot always determine what someone meant by a term or phrase. It is relatively easy in a large analysis to misinterpret a result because you did not take into account the subtleties or context of meaning. However, content analysis has the advantage of being unobtrusive and, depending on whether automated methods exist, can be a relatively rapid method for analyzing large amounts of text.

Schilling (2006) sought to bring some order to the diversity of analytic procedures for content analysis with the "spiral" model reproduced in Figure 13–4. Schilling's model is an attempt to address the frequent criticism of qualitative methods that there is a lack of systematic procedures that would allow replication by other researchers using the same data. The model is described as providing a more rules-based and transparent method of analysis. For example, prior to engaging in formal analysis, he advised that explicit rules for anonymizing participants should be written. That is, how will any part of the text that might compromise the anonymity of participants (assuming it has been promised by the researcher) be handled? A simple rule for recoding such text will facilitate the preparation for analysis, and reporting it in the methods section of the write-up will allow others to replicate the study. For example, if you know that one and only one of your participants had a job that was well known by the public, then transcripts could be reviewed to convert all references that might reveal the job and therefore the person's identity to a disguised form prior to the analysis and write-up. Being able to assure such a participant of this aspect of the study would have both ethical and methodological benefits.

13-3 Computerized Qualitative Data Analysis

Computerized qualitative data analysis is attractive because computers are so helpful in organizing, searching, sorting, and otherwise processing large amounts of data in systematic, rule-based ways. Programs make it possible to examine large

amounts of text efficiently for overall patterns as well as specific instances of particular kinds of words or phrases.

As an example of the power of the computer in qualitative analysis, think of the index at the end of this book (or any other book) as a kind of coding scheme for the major ideas in the text. The index shows you every major or nontrivial occurrence of the key ideas in the text. Now imagine that you are doing a qualitative study and have completed an initial coding of 10 transcripts, have developed your preliminary coding of key themes, but still have 500 more transcripts to study. Your initial coding is like a draft of a book index, but it covers only a tiny fraction of your whole dataset. You might never be able to complete the analysis of all of your data by hand, but with the help of a computer program, you could expedite the analysis of the rest of the transcripts by applying your initial coding scheme to them rather than continuing to evolve the coding scheme. In other words, you can sample a subset of transcripts (hopefully a subset that represents the variety of viewpoints in all the transcripts) and then apply the initial coding scheme much more rapidly to the rest of the population. You might quickly recognize the inherent limit in this approach: What if your initial coding scheme is somehow biased or overly narrow? Expect that developing your coding scheme will require a very significant investment of time and brain power as you tinker with it.

You will probably need to be an even more careful and critical thinker if you use a computer program than if you do not because, as you probably all know, Murphy's Law (what can go wrong, will go wrong) must have been written shortly after the invention of computers. Thus, we should never think that the computer will "do the analysis for us." As with quantitative analysis, careful and deliberate analysis requires that we maintain some level of direct involvement with the data and double check every step.

The software options available to qualitative researchers are many and constantly growing. Most have at their core systems for coding and locating units of text, audio, or video, and some have added features to enable data management, open-coding, theory building, and reporting. There are numerous commercially available programs and a good number of free ones as well.

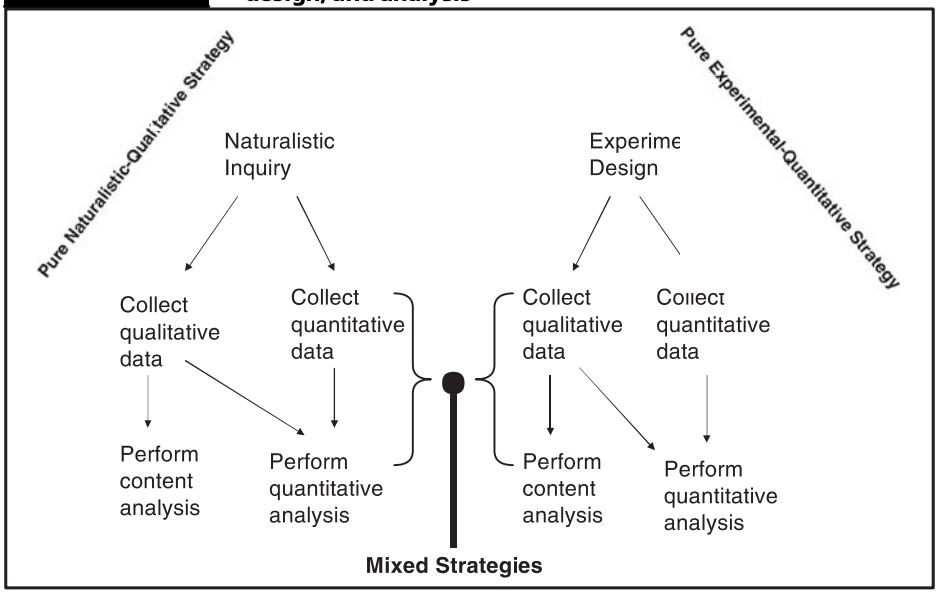
A project in the United Kingdom has been initiated to support computerized qualitative data analysis. The Computer-assisted Qualitative Data Analysis (CAQDAS) project (http://caqdas.soc.surrey.ac.uk/) provides support, training, and information on a great variety of freely available and commercial software. At present, nearly 40 programs are listed in their links section, a large but not completely exhaustive list (which would be impossible given the continuing changes in the field). The project has recently published the fifth edition of their online guide to qualitative analysis software (Lewins & Silver, 2006, downloaded September, 2006, from http://caqdas.soc.surrey.ac.uk/ChoosingLewins&SilverV5July06.pdf).

I wholeheartedly agree with Lewins and Silver's comment that there is no one "best" program and that an informed choice should be based on the needs and resources available for a particular study. This is no doubt obvious, and it applies to evaluation of all computer programs, from statistical to musical. The CAWDAS guide provides a nice overview of the features and functionality of many popular programs, some of which are free, including ATLAS.ti 5, HyperRESEARCH 2.6, MAXqda2, N6, NVivo2, NVivo7, QDA Miner, Qualrus, and Transana. The site also provides links to freely available programs, including AnSWR and CDC-EZ-Text, developed and supported by the Centers for Disease Control and Prevention. Most software developers have made demonstration versions or limited licenses available for users to "try before you buy."

13-4 Mixed Methods Analysis

I begin this brief section on mixed methods analysis with a quote from a previously cited (Chapter 8) qualitative researcher and methodologist, Elliot Eisner. In a

FIGURE 13–5 **Patton's (2002) integrated model of measurement, design, and analysis**



chapter on sources and kinds of qualitative data, he said, "... I feel compelled to say that in qualitative inquiry *numbers are okay*" (1991, p. 186). He repeated the comment for emphasis and went on to make the point that we should use whatever represents our phenomena in context best, including words, number, graphs, pictures, and so on. This perspective is very helpful in mixed methods analysis, because there should be clear thinking about what the contribution of any and all quantitative and qualitative indicators may be to answering the research question.

One way to envision the possibilities for combining qualitative and quantitative analysis is Patton's model of measurement, design, and analysis reproduced in Figure 13–5. In the figure, we see that methods can be construed on a continuum from a pure naturalistic-qualitative approach at one end to a pure experimental-quantitative design at the other, with possibilities for mixing methods emanating from a point in the center of the continuum. It would be relatively simple to use this model as a base for considering options as well as a study schema once decisions on design have been rendered.

Patton's model and many of the other resources developed for qualitative analysis have more of a heuristic than prescriptive quality. That is, they can stimulate thinking about analysis possibilities more effectively than providing a formula to follow. In this sense, qualitative and mixed methods analysis is both art and science. There are few limits as to what might be considered "good data," including letters, emails, blogs, films, poems, music, portraits, photographs, tests and papers, conversations, and virtually any other reflection of lived experience. The range of possibilities for analysis is also very wide, and I encourage you to read qualitative studies to get a sense of the integrated character of measurement, design, analysis, and reporting. I also encourage you to review sources such as Miles and Huberman's (1994) handbook and to download trial or free versions of qualitative analysis programs to get a first hand (I could say *qualitative*!) sense of the possibilities.

Summary

This chapter provided a brief overview of qualitative and mixed methods analysis. The integration of measurement, design and analysis, based on the study purpose, was emphasized. Grounded theory, one of the best-known qualitative methods, was illustrated with a review of

a study that employed the method of constant comparison. Content analysis was also discussed, and a model was introduced to provide more structure and rigor to content analysis. Computer programs to facilitate qualitative analysis have proliferated in recent years. Careful consideration of study goals and resources is necessary to choose a good fit for your particular study.

Login to the Online Edition of your text at www.atomicdog.com to find additional resources located in the Study Guide at the end of each chapter.