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Data Analysis and Representation

Analyzing text and multiple other forms of data presents a challenging task for qualitative researchers. Deciding how to represent the data in tables, matrices, and narrative form adds to the challenge. Often qualitative researchers equate data analysis with approaches for analyzing text and image data. The process of analysis is much more. It also involves organizing the data, conducting a preliminary read-through of the database, coding and organizing themes, representing the data, and forming an interpretation of them. These steps are interconnected and form a spiral of activities all related to the analysis and representation of the data.

In this chapter I begin by summarizing three general approaches to analysis provided by leading authors so that we can see how authors follow similar processes as well as different ones. I then present a visual model—a data analysis spiral—that I find useful to conceptualize a larger picture of all steps in the data analysis process in qualitative research. I use this spiral as a conceptualization to further explore each of the five approaches to inquiry, and I examine specific data analysis procedures within each approach and compare these procedures. I end with the use of computers in qualitative analysis and introduce four software programs—MAXQDA, ATLAS.ti, NVivo, and HyperRESEARCH—and discuss the common features of using software programs in data analysis as well as templates for coding data within each of the five approaches.

QUESTIONS FOR DISCUSSION

- What are common data analysis strategies used in qualitative research?
- How might the overall data analysis process be conceptualized in qualitative research?

- What are specific data analysis procedures used within each of the approaches to inquiry, and how do they differ?
- What are the procedures available in qualitative computer analysis programs, and how would these procedures differ by approach to qualitative inquiry?

THREE ANALYSIS STRATEGIES

Data analysis in qualitative research consists of preparing and organizing the data (i.e., text data as in transcripts, or image data as in photographs) for analysis, then reducing the data into themes through a process of coding and condensing the codes, and finally representing the data in figures, tables, or a discussion. Across many books on qualitative research, this is the general process that researchers use. Undoubtedly, there will be some variations in this approach. Beyond these steps, the five approaches to inquiry have additional analysis steps. Before examining the specific analysis steps in the five approaches, it is helpful to have in mind the general analysis procedures.

Table 8.1 presents typical general analysis procedures as illustrated through the writings of three qualitative researchers. I have chosen these three authors because they represent different perspectives. Madison (2005) presents an interpretive framework taken from critical ethnography, Huberman and Miles (1994) adopt a systematic approach to analysis that has a long history of use in qualitative inquiry, and Wolcott (1994b) uses a more traditional approach to research from ethnography and case study analysis. These three sources advocate many similar processes, as well as a few different approaches to the analytic phase of qualitative research.

All of these authors comment on the central steps of coding the data (reducing the data into meaningful segments and assigning names for the segments), combining the codes into broader categories or themes, and displaying and making comparisons in the data graphs, tables, and charts. These are the core elements of qualitative data analysis.

Beyond these elements, the authors present different phases in the data analysis process. Huberman and Miles (1994), for example, provide more detailed steps in the process, such as writing marginal notes, drafting summaries of field notes, and noting relationships among the categories. Madison (2005), however, introduces the need to create a point of view—a stance that signals the interpretive framework (e.g., critical,

Table 8.1 General Data Analysis Strategies Advanced by Select Authors

Analytic Strategy	*Madison (2005)*	*Huberman & Miles (1994)*	*Wolcott (1994b)*
Sketching ideas		Write margin notes in field notes	Highlight certain information in description
Taking notes		Write reflective passages in notes	
Summarizing field notes		Draft a summary sheet on field notes	
Working with words		Make metaphors	
Identifying codes	Do abstract coding or concrete coding	Write codes, memos	
Reducing codes to themes	Identify salient themes or patterns	Note patterns and themes	Identify patterned regularities
Counting frequency of codes		Count frequency of codes	
Relating categories		Factor, note relations among variables, build a logical chain of evidence	
Relating categories to analytic framework in literature			Contextualize with the framework from literature
Creating a point of view	For scenes, audience, readers		
Displaying the data	Create a graph or picture of the framework	Make contrasts and comparisons	Display findings in *tables, charts, diagrams, and figures;* compare cases; compare with a standard case

feminist) taken in the study. This point of view is central to the analysis in critical, theoretically oriented qualitative studies. Wolcott (1994b), on the other hand, discusses the importance of forming a description from the data, as well as relating the description to the literature and cultural themes in cultural anthropology.

THE DATA ANALYSIS SPIRAL

Data analysis is not off-the-shelf; rather, it is custom-built, revised, and "choreographed" (Huberman & Miles, 1994). The processes of data collection, data analysis, and report writing are not distinct steps in the process—they are interrelated and often go on simultaneously in a research project. Qualitative researchers often "learn by doing" (Dey, 1993, p. 6) data analysis. This leads critics to claim that qualitative research is largely intuitive, soft, and relativistic or that qualitative data analysts fall back on the three "I's"—"insight, intuition, and impression" (Dey, 1995, p. 78). Undeniably, qualitative researchers preserve the unusual and serendipitous, and writers craft studies differently, using analytic procedures that often evolve while they are in the field. Despite this uniqueness, I believe that the analysis process conforms to a general contour.

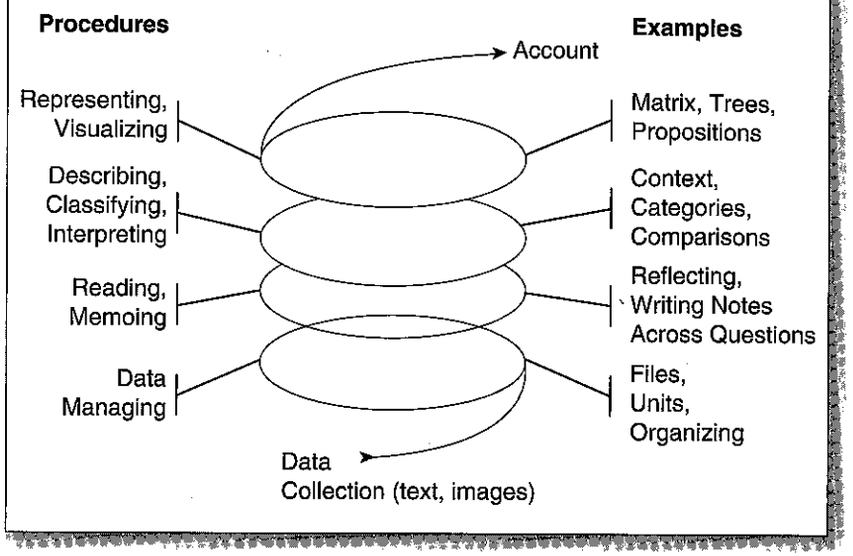
The contour is best represented in a spiral image, a data analysis spiral. As shown in Figure 8.1, to analyze qualitative data, the researcher engages in the process of moving in analytic circles rather than using a fixed linear approach. One enters with data of text or images (e.g., photographs, videotapes) and exits with an account or a narrative. In between, the researcher touches on several facets of analysis and circles around and around.

Organizing the Data

Data management, the first loop in the spiral, begins the process. At an early stage in the analysis process, researchers typically organize their data into computer files. Besides organizing files, researchers convert their files to appropriate text units (e.g., a word, a sentence, an entire story) for analysis either by hand or by computer. Materials must be easily located in large databases of text (or images). As Patton (1980) says,

> The data generated by qualitative methods are voluminous. I have found no way of preparing students for the sheer massive volumes

Figure 8.1 The Data Analysis Spiral



> of information with which they will find themselves confronted when data collection has ended. Sitting down to make sense out of pages of interviews and whole files of field notes can be overwhelming. (p. 297)

Computer programs help with this phase of analysis, and their role in this process will be addressed later in this chapter.

Reading and Memoing

Following the organization of the data, researchers continue analysis by getting a sense of the whole database. Agar (1980), for example, suggested that researchers "read the transcripts in their entirety several times. Immerse yourself in the details, trying to get a sense of the interview as a whole before breaking it into parts" (p. 103). Writing notes or memos in the margins of field notes or transcripts or under photographs helps in this initial process of exploring a database. These memos are short phrases, ideas, or key concepts that occur to the reader. We used

this procedure in our gunman case study (Asmussen & Creswell, 1995; see Appendix F). We scanned all of our databases to identify major organizing ideas. Looking over our field notes from observations, interview transcriptions, physical trace evidence, and audio and visual images, we disregarded predetermined questions so we could "see" what interviewees said. We reflected on the larger thoughts presented in the data and formed initial categories. These categories were few in number (about 10), and we looked for multiple forms of evidence to support each. Moreover, we found evidence that portrayed multiple perspectives about each category (Stake, 1995).

Describing, Classifying, and Interpreting Data Into Codes and Themes

The next step consists of moving from the reading and memoing in the spiral to describing, classifying, and interpreting the data. In this loop, forming *codes* or *categories* (and these two terms will be used interchangeably) represents the heart of qualitative data analysis. Here researchers build detailed descriptions, develop themes or dimensions, and provide an interpretation in light of their own views or views of perspectives in the literature. *Detailed description* means that authors describe what they see. This detail is provided *in situ,* that is, within the context of the setting of the person, place, or event. Description becomes a good place to start in a qualitative study (after reading and managing data), and it plays a central role in ethnographic and case studies.

The process of ***coding*** involves aggregating the text or visual data into small categories of information, seeking evidence for the code from different databases being used in a study, and then assigning a label to the code. I think about "winnowing" the data here; not all information is used in a qualitative study, and some may be discarded (Wolcott, 1994b). Researchers develop a short list of tentative codes (e.g., 25–30 or so) that match text segments, regardless of the length of the database. Beginning researchers tend to develop elaborate lists of codes when they review their databases. I proceed differently. I begin with a short list, "lean coding" I call it—five or six categories with shorthand labels or codes—and then I expand the categories as I continue to review and re-review my database. Typically, regardless of the size of the database, I do not develop more than 25–30 categories of information, and I find

myself working to reduce and combine them into the five or six themes that I will use in the end to write my narrative. Those researchers who end up with 100 or 200 categories—and it is easy to find this many in a complex database—struggle to reduce the picture to the five or six themes that they must end with for most publications.

Several issues are important to address in this coding process. The first is whether qualitative researchers should count codes. Huberman and Miles (1994), for example, suggest that investigators make preliminary counts of data codes and determine how frequently codes appear in the database. Some (but not all) qualitative researchers feel comfortable counting and reporting the number of times the codes appear in their databases. It does provide an indicator of frequency of occurrence, something typically associated with quantitative research or systematic approaches to qualitative research. In my own work, I may look at the number of passages associated with each code as an indicator of participant interest in a code, but I do not report counts in my articles (see Asmussen & Creswell, 1995). This is because counting conveys a quantitative orientation of magnitude and frequency contrary to qualitative research. In addition, a count conveys that all codes should be given equal emphasis, and it disregards that the passages coded may actually represent contradictory views.

Another issue is the use of preexisting or a priori codes that guide my coding process. Again, we have a mixed reaction to the use of this procedure. Crabtree and Miller (1992) discuss a continuum of coding strategies that range from "prefigured" categories to "emergent" categories (p. 151). Using "prefigured" codes or categories (often from a theoretical model or the literature) is popular in the health sciences (Crabtree & Miller, 1992), but use of these codes does serve to limit the analysis to the "prefigured" codes rather than opening up the codes to reflect the views of participants in a traditional qualitative way. If a "prefigured" coding scheme is used in analysis, I typically encourage the researchers to be open to additional codes emerging during the analysis.

Another issue is the question as to the origin of the code names or labels. Code labels emerge from several sources. They might be ***in vivo codes***, names that are the exact words used by participants. They might also be code names drawn from the social or health sciences (e.g., coping strategies), or names the researcher composes that seem to best describe the information. In the process of data analysis, I encourage qualitative researchers to look for code

segments that can be used to describe information and develop themes. These codes can represent

- information that researchers expect to find before the study;
- surprising information that researchers did not expect to find; and
- information that is conceptually interesting or unusual to researchers (and potentially participants and audiences).

Moving beyond coding, classifying pertains to taking the text or qualitative information apart, and looking for categories, themes, or dimensions of information. As a popular form of analysis, classification involves identifying five to seven general themes. ***Themes*** in qualitative research (also called categories) are broad units of information that consist of several codes aggregated to form a common idea. These themes, in turn, I view as a "family" of themes with children, or subthemes, and even grandchildren represented by segments of data. It is difficult, especially in a large database, to reduce the information down into five or seven "families," but my process involves winnowing the data, reducing them to a small, manageable set of themes to write into my final narrative.

A related topic is the types of information a qualitative researcher codes. The researcher might look for stories (as in narrative research); individual experiences and the context of those experiences (in phenomenology); processes, actions, or interactions (in grounded theory); cultural themes and how the culture-sharing group works that can be described or categorized (in ethnography); or a detailed description of the particular case or cases (in case study research). Another way of thinking about the types of information would be to use a deconstructive stance, a stance focused on issues of desire and power (Czarniawska, 2004). Czarniawska (2004) identifies the data analysis strategies used in deconstruction, adapted from Martin (1990, p. 355), that help focus attention on types of information to analyze from qualitative data in all approaches:

- Dismantling a dichotomy, exposing it as a false distinction (e.g., public/private, nature/culture)
- Examining silences—what is not said (e.g., noting who or what is excluded by the use of pronouns such as *we*)
- Attending to disruptions and contradictions; places where a text fails to make sense or does not continue

- Focusing on the element that is most alien or peculiar in the text—to find the limits of what is conceivable or permissible
- Interpreting metaphors as a rich source of multiple meanings
- Analyzing double entendres that may point to an unconscious subtext, often sexual in content
- Separating group-specific and more general sources of bias by "reconstructing" the text with substitution of its main elements

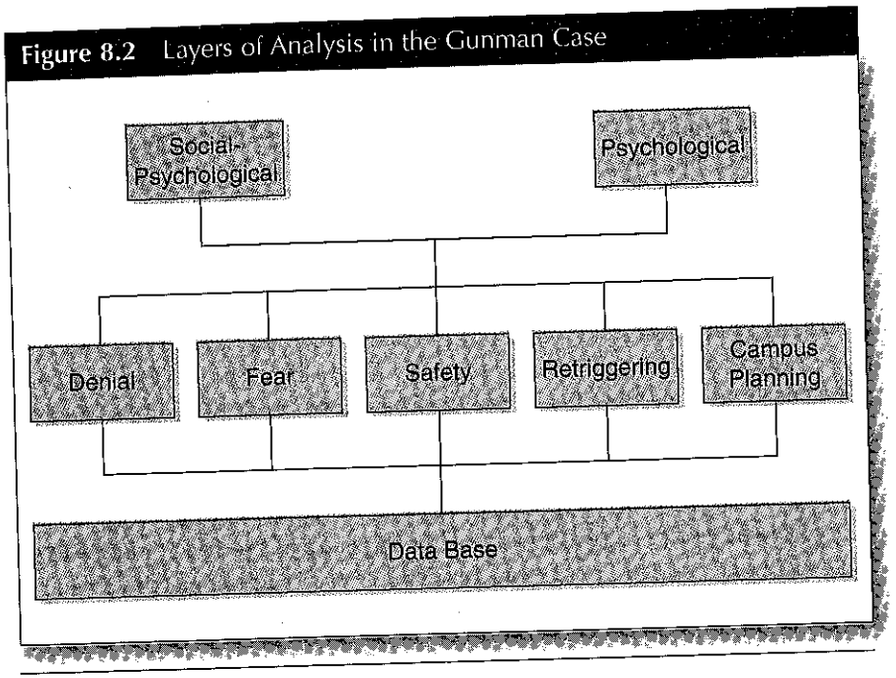
Interpreting the Data

Researchers engage in interpreting the data when they conduct qualitative research. Interpretation involves making sense of the data, the "lessons learned," as described by Lincoln and Guba (1985). ***Interpretation*** in qualitative research involves abstracting out beyond the codes and themes to the larger meaning of the data. It is a process that begins with the development of the codes, the formation of themes from the codes, and then the organization of themes into larger units of abstraction to make sense of the data. Several forms exist, such as interpretation based on hunches, insights, and intuition. Interpretation also might be within a social science construct or idea or a combination of personal views as contrasted with a social science construct or idea. Thus, the researcher would link his or her interpretation to the larger research literature developed by others. For postmodern and interpretive researchers, these interpretations are seen as tentative, inconclusive, and questioning.

Representing and Visualizing the Data

In the final phase of the spiral, researchers ***represent the data***, a packaging of what was found in text, tabular, or figure form. For example, creating a visual image of the information, a researcher may present a comparison table (see Spradley, 1980) or a matrix—for example, a 2 × 2 table that compares men and women in terms of one of the themes or categories in the study (see Miles & Huberman, 1994). The cells contain text, not numbers. A hierarchical tree diagram represents another form of presentation. This shows different levels of abstraction, with the boxes in the top of the tree representing the most abstract information and those at the bottom representing the least abstract themes. Figure 8.2 illustrates

Figure 8.2 Layers of Analysis in the Gunman Case



Source: Asmussen & Creswell (1995).

the levels of abstraction that we used in the gunman case (Asmussen & Creswell, 1995; see Appendix F). Although I have presented this figure at conferences, we did not include it in the published journal article version of the study. This illustration shows inductive analysis that begins with the raw data consisting of multiple sources of information and then broadens to several specific themes (e.g., safety, denial) and on to the most general themes represented by the two perspectives of social-psychological and psychological factors.

Hypotheses or propositions that specify the relationship among categories of information also represent qualitative data. In grounded theory, for example, investigators advance propositions that interrelate the causes of a phenomenon with its context and strategies. Finally, authors present metaphors to analyze the data, literary devices in which something borrowed from one domain applies to another (Hammersley & Atkinson, 1995). Qualitative writers may compose entire studies shaped by analyses of metaphors.

At this point, the researcher might obtain feedback on the initial summaries by taking information back to informants, a procedure to be discussed in Chapter 10 as a key validation step in research.

ANALYSIS WITHIN APPROACHES TO INQUIRY

Beyond the general spiral analysis processes, I can now relate the procedures to each of the five approaches to inquiry and highlight specific differences in analysis and representing data. My organizing framework for this discussion is found in Table 8.2. I address each approach and discuss specific analysis and representing characteristics. At the end of this discussion, I return to significant differences and similarities among the five approaches.

Narrative Research Analysis and Representation

I think that Riessman (2008) says it best when she comments that narrative analysis "refers to a family of methods for interpreting texts that have in common a storied form" (p. 11). The data collected in a narrative study need to be analyzed for the story they have to tell, a chronology of unfolding events, and turning points or epiphanies. Within this broad sketch of analysis, several options exist for the narrative researcher.

A narrative researcher can take a literary orientation to his or her analysis. For example, using a story in science education told by four fourth graders in one elementary school, Ollerenshaw and I (Ollerenshaw & Creswell, 2002) include several approaches to narrative analysis. One approach is a process advanced by Yussen and Ozcan (1997) that involves analyzing text data for five elements of plot structure (i.e., characters, setting, problem, actions, and resolution). A narrative researcher could use an approach that incorporates different elements that go into the story. The three-dimensional space approach of Clandinin and Connelly (2000) includes analyzing the data for three elements: interaction (personal and social), continuity (past, present, and future), and situation (physical places or the storyteller's places). In the Ollerenshaw and Creswell (2002) narrative we see common elements of narrative analysis: collecting stories of personal experiences in the form of field texts such as interviews or conversations, retelling the stories based on narrative elements (e.g., three-dimensional space approach and the five elements of plot), rewriting the stories into a chronological sequence, and incorporating the setting or place of the participants' experiences.

A chronological approach can also be taken in the analysis of the narratives. Denzin (1989b) suggests that a researcher begin biographical

Table 8.2 Data Analysis and Representation by Research Approaches

Data Analysis and Representation	*Narrative*	*Phenomenology*	*Grounded Theory Study*	*Ethnography*	*Case Study*
Data organization	• Create and organize files for data	• Create and organize files for data	• Create and organize files for data	• Create and organize files for data	• Create and organize files for data
Reading, memoing	• Read through text, make margin notes, form initial codes	• Read through text, make margin notes, form initial codes	• Read through text, make margin notes, form initial codes	• Read through text, make margin notes, form initial codes	• Read through text, make margin notes, form initial codes
Describing the data into codes and themes	• Describe the story or objective set of experiences and place it in a chronology	• Describe personal experiences through epoche • Describe the essence of the phenomenon	• Describe open coding categories	• Describe the social setting, actors, events; draw picture of setting	• Describe the case and its context
Classifying the data into codes and themes	• Identify stories • Locate epiphanies • Identify contextual materials	• Develop significant statements • Group statements into meaning units	• Select one open coding category for central phenomenon in process • Engage in axial coding—causal condition, context, intervening conditions, strategies, consequences	• Analyze data for themes and patterned regularities	• Use categorical aggregation to establish themes or patterns

Data Analysis and Representation	*Narrative*	*Phenomenology*	*Grounded Theory Study*	*Ethnography*	*Case Study*
Interpreting the data	• Interpret the larger meaning of the story	• Develop a textural description, "what happened" • Develop a structural description, "how" the phenomenon was experienced • Develop the "essence"	• Engage in selective coding and interrelate the categories to develop a "story" or propositions	• Interpret and make sense of the findings—how the culture "works"	• Use direct interpretation • Develop naturalistic generalizations of what was "learned"
Representing, visualizing the data	• Present narration focusing on processes, theories, and unique and general features of the life	• Present narration of the "essence" of the experience; in tables, figures, or discussion	• Present a visual model or theory • Present propositions	• Present narrative presentation augmented by tables, figures, and sketches	• Present in-depth picture of the case (or cases) using narrative, tables, and figures

analysis by identifying an objective set of experiences in the subject's life. Having the individual journal a sketch of his or her life may be a good beginning point for analysis. In this sketch, the researcher looks for life-course stages or experiences (e.g., childhood, marriage, employment) to develop a ***chronology*** of the individual's life. Stories and epiphanies will emerge from the individual's journal or from interviews. The researcher looks in the database (typically interviews or documents) for concrete, contextual biographical materials. During the interview, the researcher prompts the participant to expand on various sections of the stories and asks the interviewee to theorize about his or her life. These theories may relate to career models, processes in the life course, models of the social world, relational models of biography, and natural history models of the life course. Then, the researcher organizes larger patterns and meaning from the narrative segments and categories. Finally, the individual's biography is reconstructed, and the researcher identifies factors that have shaped the life. This leads to the writing of an analytic abstraction of the case that highlights (a) the processes in the individual's life, (b) the different theories that relate to these life experiences, and (c) the unique and general features of the life.

Another approach to narrative analysis turns on how the narrative report is composed. Riessman (2008) suggests a typology of four analytic strategies that reflect this diversity in composing the stories. Riessman calls it thematic analysis when the researcher analyzes "what" is spoken or written during data collection. She comments that this approach is the most popular form of narrative studies, and we see it in the Chan (2010) narrative project reported in Appendix B. A second form in Riessman's (2008) typology is called the structural form, and it emphasizes "how" a story is told. This brings in linguistic analysis in which the individual telling the story uses form and language to achieve a particular effect. Discourse analysis, based on Gee's (1991) method, would examine the storytellers' narrative for such elements as the sequence of utterances, the pitch of the voice, and the intonation. A third form for Riessman (2008) is the dialogic/performance analysis, in which the talk is interactively produced by the researcher and the participant or actively performed by the participant through such activities as poetry or a play. The fourth form is an emerging area of using visual analysis of images or interpreting images alongside words. It could also be a story told about the production of an image or how different audiences view an image.

In the narrative study of Ai Mei Zhang, the Chinese immigrant student presented by Chan (2010) in Appendix B, the analytic approach begins

with a thematic analysis similar to Riessman's (2008) approach. After briefly mentioning a description of Ai Mei's school, Chan then discusses several themes, all of which have to do with conflict (e.g., home language conflicts with school language). That Chan saw conflict introduces the idea that she analyzed the data for this phenomenon, and rendered the theme development from a postmodern type of interpretive lens. Chan then goes on to analyze the data beyond the themes to explore her role as a narrative researcher learning about Ai Mei's experiences. Thus, while overall the analysis is based on a thematic approach, the introduction of conflict and the researcher's experiences adds a thoughtful conceptual analysis to the study.

Phenomenological Analysis and Representation

The suggestions for narrative analysis present a general template for qualitative researchers. In contrast, in phenomenology, there have been specific, structured methods of analysis advanced, especially by Moustakas (1994). Moustakas reviews several approaches in his book, but I see his modification of the Stevick-Colaizzi-Keen method as providing the most practical, useful approach. My approach, a simplified version of this method discussed by Moustakas (1994), is as follows:

- First describe personal experiences with the phenomenon under study. The researcher begins with a full description of his or her own experience of the phenomenon. This is an attempt to set aside the researcher's personal experiences (which cannot be done entirely) so that the focus can be directed to the participants in the study.
- Develop a list of significant statements. The researcher then finds statements (in the interviews or other data sources) about how individuals are experiencing the topic, lists these significant statements (horizonalization of the data) and treats each statement as having equal worth, and works to develop a list of nonrepetitive, nonoverlapping statements.
- Take the significant statements and then group them into larger units of information, called "meaning units" or themes.
- Write a description of "what" the participants in the study experienced with the phenomenon. This is called a "textural description" of the experience—what happened—and includes verbatim examples.

- Next write a description of "how" the experience happened. This is called "structural description," and the inquirer reflects on the setting and context in which the phenomenon was experienced. For example, in a phenomenological study of the smoking behavior of high school students (McVea, Harter, McEntarffer, & Creswell, 1999), my colleagues and I provide a structural description about where the phenomenon of smoking occurs, such as in the parking lot, outside the school, by student lockers, in remote locations at the school, and so forth.
- Finally, write a composite description of the phenomenon incorporating both the textural and structural descriptions. This passage is the "essence" of the experience and represents the culminating aspect of a phenomenological study. It is typically a long paragraph that tells the reader "what" the participants experienced with the phenomenon and "how" they experienced it (i.e., the context).

Moustakas (1994) is a psychologist, and the "essence" typically is of a phenomenon in psychology, such as grief or loss. Giorgi (2009), also a psychologist, provides an analytic approach similar to that of Stevick-Colaizzi-Keen. Giorgi discusses how researchers read for a sense of the whole, determine meaning units, transform the participants' expressions into psychologically sensitive expressions, and then write a description of the "essence." Most helpful in Giorgi's discussion is the example he provides of describing jealousy as analyzed by himself and another researcher.

The phenomenological study by Riemen (1986) tends to follow a structured analytic approach. In Riemen's study of caring by patients and their nurses, she presents significant statements of caring and noncaring interactions for both males and females. Furthermore, Riemen formulates meaning statements from these significant statements and presents them in tables. Finally, Riemen advances two "exhaustive" descriptions for the essence of the experience—two short paragraphs—and sets them apart by enclosing them in tables. In the phenomenological study of individuals with AIDS by Anderson and Spencer (2002; see Appendix C) reviewed in Chapter 5, the authors use Colaizzi's (1978) method of analysis, one of the approaches mentioned by Moustakas (1994). This approach follows the general guideline of analyzing the data for significant phrases, developing meanings and clustering them into themes, and presenting an exhaustive description of the phenomenon.

A less structured approach is found in van Manen (1990). He begins discussing data analysis by calling it "phenomenological reflection"

(van Manen, 1990, p. 77). The basic idea of this reflection is to grasp the essential meaning of something. The wide array of data sources of expressions or forms that we would reflect on might be transcribed taped conversations, interview materials, daily accounts or stories, suppertime talk, formally written responses, diaries, other people's writings, film, drama, poetry, novels, and so forth. Van Manen (1990) placed emphasis on gaining an understanding of themes by asking, "What is this example an example of?" (p. 86). These themes should have certain qualities such as focus, a simplification of ideas, and a description of the structure of the lived experience. The process involved attending to the entire text (holistic reading approach), looking for statements or phrases (selective or highlighting approach), and examining every sentence (the detailed or line-by-line approach). Attending to four guides for reflection was also important: the space felt by individuals (e.g., the modern bank), physical or bodily presence (e.g., what does a person in love look like?), time (e.g., the dimensions of past, present, and future), and the relationships with others (e.g., expressed through a handshake). In the end, analyzing the data for themes, using different approaches to examine the information, and considering the guides for reflection should yield an explicit structure of the meaning of the lived experience.

Grounded Theory Analysis and Representation

Similar to phenomenology, grounded theory uses detailed procedures for analysis. It consists of three phases of coding—open, axial, and selective—as advanced by Strauss and Corbin (1990, 1998). Grounded theory provides a procedure for developing categories of information (open coding), interconnecting the categories (axial coding), building a "story" that connects the categories (selective coding), and ending with a discursive set of theoretical propositions (Strauss & Corbin, 1990).

In the open coding phase, the researcher examines the text (e.g., transcripts, field notes, documents) for salient categories of information supported by the text. Using the constant comparative approach, the researcher attempts to "saturate" the categories—to look for instances that represent the category and to continue looking (and interviewing) until the new information obtained does not provide further insight into the category. These categories are composed of subcategories, called "properties," that represent multiple perspectives about the categories. Properties, in turn, are ***dimensionalized*** and presented on a continuum. Overall,

this is the process of reducing the database to a small set of themes or categories that characterize the process or action being explored in the grounded theory study.

Once an initial set of categories has been developed, the researcher identifies a single category from the open coding list as the central phenomenon of interest. The open coding category selected for this purpose is typically one that is extensively discussed by the participants or one of particular conceptual interest because it seems central to the process being studied in the grounded theory project. The inquirer selects this one open coding category (a central phenomenon), positions it as the central feature of the theory, and then returns to the database (or collects additional data) to understand the categories that relate to this central phenomenon. Specifically, the researcher engages in the coding process called axial coding in which the database is reviewed (or new data are collected) to provide insight into specific coding categories that relate to or explain the central phenomenon. These are causal conditions that influence the central phenomenon, the strategies for addressing the phenomenon, the context and intervening conditions that shape the strategies, and the consequences of undertaking the strategies. Information from this coding phase are then organized into a figure, a coding paradigm, that presents a theoretical model of the process under study. In this way, a theory is built or generated. From this theory, the inquirer generates propositions (or hypotheses) or statements that interrelate the categories in the coding paradigm. This is called selective coding. Finally, at the broadest level of analysis, the researcher can create a conditional matrix. This matrix is an analytical aid—a diagram—that helps the researcher visualize the wide range of conditions and consequences (e.g., society, world) related to the central phenomenon (Strauss & Corbin, 1990). Seldom have I found the conditional matrix actually used in studies.

A key to understanding the difference that Charmaz (2006) brings to grounded theory data analysis is to hear her say "avoid imposing a forced framework" (p. 66). Her approach emphasized an emerging process of forming the theory. Her analytic steps began with an initial phase of coding each word, line, or segment of data. At this early stage she was interested in having the initial codes treated analytically to understand a process and larger theoretical categories. This initial phase was followed by focused coding, using the initial codes to sift through large amounts of data, analyzing for syntheses and larger explanations. She did not support the Strauss and Corbin (1998) formal procedures of axial coding that organized the data into conditions, actions/interactions, consequences, and so

forth. However, Charmaz (2006) did examine the categories and begins to develop links among them. She also believed in using theoretical coding, first developed by Glaser (1978). This step involved specifying possible relationships between categories based on a priori theoretical coding families (e.g., causes, context, ordering). However, Charmaz (2006) goes on to say that these theoretical codes needed to earn their way into the grounded theory that emerges. The theory that emerged for Charmaz emphasizes understanding rather than explanation. It assumes emergent, multiple realities; the link of facts and values; provisional information; and a narrative about social life as a process. It might be presented as a figure or as a narrative that pulls together experiences and shows the range of meanings.

The specific form for presenting the theory differs. In our study of department chairs, Brown and I present it as hypotheses (Creswell & Brown, 1992), and in their study of the process of the evolution of physical activity for African American women (see Appendix D), Harley et al. (2009) presented a discussion of a theoretical model as displayed in a figure with three phases. In the Harley et al. study, the analysis consisted of citing Strauss and Corbin (1998) and then creating codes, grouping these codes into concepts, and forming a theoretical framework. The specific steps of open coding were not reported; however, the results section focused on the theoretical model's phases, and the axial coding steps of context, conditions, and an elaboration on the condition most integral to the women's movement through the process, the planning methods.

Ethnographic Analysis and Representation

For ethnographic research, I recommend the three aspects of data analysis advanced by Wolcott (1994b): description, analysis, and ***interpretation of the culture-sharing group***. Wolcott (1990b) believes that a good starting point for writing an ethnography is to describe the culture-sharing group and setting:

> Description is the foundation upon which qualitative research is built. . . . Here you become the storyteller, inviting the reader to see through your eyes what you have seen. . . . Start by presenting a straightforward description of the setting and events. No footnotes, no intrusive analysis—just the facts, carefully presented and interestingly related at an appropriate level of detail. (p. 28)

From an interpretive perspective, the researcher may only present one set of facts; other facts and interpretations await the reading of the ethnography by the participants and others. But this description may be analyzed by presenting information in chronological order. The writer describes through progressively focusing the description or chronicling a "day in the life" of the group or individual. Finally, other techniques involve focusing on a critical or key event, developing a "story" complete with a plot and characters, writing it as a "mystery," examining groups in interaction, following an analytical framework, or showing different perspectives through the views of participants.

Analysis for Wolcott (1994b) is a sorting procedure—"the quantitative side of qualitative research" (p. 26). This involves highlighting specific material introduced in the descriptive phase or displaying findings through tables, charts, diagrams, and figures. The researcher also analyzes through using systematic procedures such as those advanced by Spradley (1979, 1980), who called for building taxonomies, generating comparison tables, and developing semantic tables. Perhaps the most popular analysis procedure, also mentioned by Wolcott (1994b), is the search for patterned regularities in the data. Other forms of analysis consist of comparing the cultural group to others, evaluating the group in terms of standards, and drawing connections between the culture-sharing group and larger theoretical frameworks. Other analysis steps include critiquing the research process and proposing a redesign for the study.

Making an ethnographic interpretation of the culture-sharing group is a data transformation step as well. Here the researcher goes beyond the database and probes "what is to be made of them" (Wolcott, 1994b, p. 36). The researcher speculates outrageous, comparative interpretations that raise doubts or questions for the reader. The researcher draws inferences from the data or turns to theory to provide structure for his or her interpretations. The researcher also personalizes the interpretation: "This is what I make of it" or "This is how the research experience affected me" (p. 44). Finally, the investigator forges an interpretation through expressions such as poetry, fiction, or performance.

Multiple forms of analysis represent Fetterman's (2010) approach to ethnography. He did not have a lockstep procedure, but recommended triangulating the data by testing one source of data against another, looking for patterns of thought and behavior, and focusing in on key events that the ethnography can use to analyze an entire culture (e.g., ritual observance of the Sabbath). Ethnographers also draw maps of the setting, develop charts, design matrices, and sometimes employ statistical analysis

to examine frequency and magnitude. They might also crystallize their thoughts to provide "a mundane conclusion, a novel insight, or an earth-shattering epiphany" (Fetterman, 2010, p. 109).

The ethnography presented in Appendix E by Haenfler (2004) applied a critical perspective to these analytic procedures of ethnography. Haenfler provided a detailed description of the straight edge core values of resistance to other cultures and then discussed five themes related to these core values (e.g., positive, clean living). Then the conclusion to the article included broad interpretations of the group's core values, such as the individualized and collective meanings for participation in the subculture. However, Haenfler began the methods discussion with a self-disclosing, positioning statement about his background and participation in the straight edge movement. This positioning was also presented as a chronology of his experiences from 1989 to 2001.

Case Study Analysis and Representation

For a case study, as in ethnography, analysis consists of making a detailed description of the case and its setting. If the case presents a chronology of events, I then recommend analyzing the multiple sources of data to determine evidence for each step or phase in the evolution of the case. Moreover, the setting is particularly important. In our gunman case (Asmussen & Creswell, 1995; see Appendix F), we analyzed the information to determine how the incident fit into the setting—in our situation, a tranquil, peaceful Midwestern community.

In addition, Stake (1995) advocates four forms of data analysis and interpretation in case study research. In categorical aggregation, the researcher seeks a collection of instances from the data, hoping that issue-relevant meanings will emerge. In ***direct interpretation***, on the other hand, the case study researcher looks at a single instance and draws meaning from it without looking for multiple instances. It is a process of pulling the data apart and putting them back together in more meaningful ways. Also, the researcher establishes ***patterns*** and looks for a correspondence between two or more categories. This correspondence might take the form of a table, possibly a 2×2 table, showing the relationship between two categories. Yin (2009) advances a cross-case synthesis as an analytic technique when the researcher studies two or more cases. He suggests that a word table can be created to display the data from individual cases according to some uniform

framework. The implication of this is that the researcher can then look for similarities and differences among the cases. Finally, the researcher develops ***naturalistic generalizations*** from analyzing the data, generalizations that people can learn from the case either for themselves or to apply to a population of cases.

To these analysis steps I would add description of the case, a detailed view of aspects about the case—the "facts." In our gunman case study (Asmussen & Creswell, 1995; Appendix F), we described the events following the incident for two weeks, highlighting the major players, the sites, and the activities. We then aggregated the data into about 20 categories (categorical aggregation) and collapsed them into five themes. In the final section of the study, we developed generalizations about the case in terms of the themes and how they compared and contrasted with published literature on campus violence.

COMPARING THE FIVE APPROACHES

Returning to Table 8.2, data analysis and representation in the five approaches have several common and distinctive features. Across all five approaches, the researcher typically begins by creating and organizing files of information. Next, the process consists of a general reading and memoing of information to develop a sense of the data and to begin the process of making sense of them. Then, all approaches have a phase of description, with the exception of grounded theory, in which the inquirer seeks to begin building toward a theory of the action or process.

However, several important differences exist in the five approaches. Grounded theory and phenomenology have the most detailed, explicated procedure for data analysis, depending on the author chosen for guidance on analysis. Ethnography and case studies have analysis procedures that are common, and narrative research represents the least structured procedure. Also, the terms used in the phase of classifying show distinct language among these approaches (see Appendix A for a glossary of terms used in each approach); what is called open coding in grounded theory is similar to the first stage of identifying significant statements in phenomenology and to categorical aggregation in case study research. The researcher needs to become familiar with the definition of these terms of analysis and employ them correctly in the chosen approach to inquiry. Finally, the presentation of the data, in turn, reflects the data analysis steps, and it varies from a narration in narrative to tabled statements,

meanings, and description in phenomenology to a visual model or theory in grounded theory.

COMPUTER USE IN QUALITATIVE DATA ANALYSIS

Qualitative computer programs have been available since the late 1980s, and they have become more refined and helpful in computerizing the process of analyzing text and image data (see Weitzman and Miles, 1995, for a review of 24 programs). Friese (2012) provides a discussion about one program, ATLAS.ti. The Corbin and Strauss (2007) book contains an extensive illustration of the use of the software program MAXQDA to discuss grounded theory.

The process used for qualitative data analysis is the same for hand coding or using a computer: the inquirer identifies a text segment or image segment, assigns a code label, searches through the database for all text segments that have the same code label, and develops a printout of these text segments for the code. In this process the researcher, not the computer program, does the coding and categorizing.

Advantages and Disadvantages

The computer program simply provides a means for storing the data and easily accessing the codes provided by the researcher. I feel that computer programs are most helpful with large databases, such as 500 or more pages of text, although they can have value for small databases as well. Although using a computer may not be of interest to all qualitative researchers, there are several advantages to using them:

- A computer program provides an organized storage file system so that the researcher can quickly and easily locate material and store it in one place. This aspect becomes especially important in locating entire cases or cases with specific characteristics.
- A computer program helps a researcher locate material easily, whether this material is an idea, a statement, a phrase, or a word. No longer do we need to "cut and paste" material onto file cards and sort and resort the cards according to themes. No longer do we need to develop an elaborate "color code" system for text

related to themes or topics. The search for text can be easily accomplished with a computer program. Once researchers identify categories in grounded theory, or themes in case studies, the names of the categories can be searched using the computer program for other instances when the names occur in the database.

- A computer program encourages a researcher to look closely at the data, even line by line, and think about the meaning of each sentence and idea. Sometimes, without a program, the researcher is likely to casually read through the text files or transcripts and not analyze each idea carefully.
- The concept-mapping feature of computer programs enables the researcher to visualize the relationship among codes and themes by drawing a visual model.
- A computer program allows the researcher to easily retrieve memos associated with codes, themes, or documents.

The disadvantages of using computer programs go beyond their cost:

- Using a computer program requires that the researcher learn how to run the program. This is sometimes a daunting task that is above and beyond learning required for understanding the procedures of qualitative research. Granted, some people learn computer programs more easily than do others, and prior experience with programs shortens the learning time.
- A computer program may, to some individuals, put a machine between the researcher and the actual data. This may cause an uncomfortable distance between the researcher and his or her information.
- Although researchers may see the categories developed during computer analysis as fixed, they can be changed in software programs (Kelle, 1995). Some individuals may find changing the categories or moving information around less desirable than others and find that the computer program slows down or inhibits this process.
- Instructions for using computer programs vary in their ease of use and accessibility. Many documents for computer programs do not provide information about how to use the program to generate a qualitative study, or one of the five approaches to research discussed in this book.
- A computer program may not have the features or capability that researchers need, so researchers can shop comparatively to find a program that meets their needs.

A Sampling of Computer Programs

There are many computer programs available for analysis; some have been developed by individuals on campuses, and some are available for commercial purchase. I highlight four commercial programs that are popular and that I have examined closely (see Creswell, 2012; Creswell & Maietta, 2002)—MAXQDA, ATLAS.ti, NVivo, and HyperRESEARCH. I have intentionally left out the version numbers and have presented a general discussion of the programs because the developers are continually upgrading the programs.

MAXQDA (http://www.maxqda.com/). MAXQDA is a computer software program that helps the researcher to systematically evaluate and interpret qualitative texts. It is also a powerful tool for developing theories and testing theoretical conclusions. The main menu has four windows: the data, the code or category system, the text being analyzed, and the results of basic and complex searches. It uses a hierarchical code system, and the researcher can attach a weight score to a text segment to indicate the relevance of the segment. Memos can be easily written and stored as different types of memos (e.g., theory memos or methodological memos). It has a visual mapping feature. Data can be exported to statistical programs, such as SPSS or Excel, and the software can import Excel or SPSS programs as well. It is easily used by multiple coders on a particular project. Images and video segments can also be stored and coded in this program. MAXQDA is distributed by VERBI Software in Germany. A demonstration program is available to learn more about the unique features of this program.

ATLAS.ti (http://www.atlasti.com). This program enables you to organize your text, graphic, audio, and visual data files, along with your coding, memos, and findings, into a project. Further, you can code, annotate, and compare segments of information. You can drag and drop codes within an interactive margin screen. You can rapidly search, retrieve, and browse all data segments and notes relevant to an idea and, importantly, build unique visual networks that allow you to connect visually selected passages, memos, and codes in a concept map. Data can be exported to programs such as SPSS, HTML, XML, and CSV. This program also allows for a group of researchers to work on the same project and make comparisons of how each researcher coded the data. A demonstration software package is available to test out this program, which is described by and available from Scientific Software Development in Germany.

QSR NVivo (http://www.qsrinternational.com/). NVivo is the latest version of software from QSR International. NVivo combines the features of the popular software program N6 (or NUD*IST 6) and NVivo 2.0. NVivo helps analyze, manage, shape, and analyze qualitative data. Its streamlined look makes it easy to use. It provides security by storing the database and files together in a single file, it enables a researcher to use multiple languages, it has a merge function for team research, and it enables the researcher to easily manipulate the data and conduct searches. Further, it can display graphically the codes and categories. A good overview of the evolution of the software from N6 to NVivo is available from Bazeley (2002). NVivo is distributed by QSR International in Australia. A demonstration copy is available to see and try out the features of this software program.

HyperRESEARCH (http://www.researchware.com/). This program is an easy-to-use qualitative software package enabling you to code and retrieve, build theories, and conduct analyses of the data. Now with advanced multimedia capabilities, HyperRESEARCH allows the researcher to work with text, graphics, audio, and video sources—making it a valuable research analysis tool. HyperRESEARCH is a solid code-and-retrieve data analysis program, with additional theory-building features provided by the Hypothesis Tester. This program also allows the researcher to draw visual diagrams, and it now has a module that can be added, called "HyperTranscriber," that will allow researchers to create a transfer of video and audio data. This program, developed by ResearchWare, is available in the United States.

Use of Computer Software Programs With the Five Approaches

After reviewing all of these computer programs, I see several ways that they can facilitate qualitative data analysis:

- Computer programs help store and organize qualitative data. The programs provide a convenient way to store qualitative data. Data are stored in document files (files converted from a word processing program to DOS, ASCII, or rich-text files in some programs). These document files consist of information from one discrete unit of information such as a transcript from one interview, one set of observational notes, or one article scanned from a newspaper. For all five of the approaches to qualitative inquiry, the document could be one interview, one observation, or one text document.

- Computer programs help locate text or image segments associated with a code or theme. When using a computer program, the researcher goes through the text or images one line or image at a time and asks, "What is the person saying (or doing) in this passage?" Then the researcher assigns a code label using the words of the participant, employing social or human science terms, or composing a term that seems to relate to the situation. After reviewing many pages or images, the researcher can use the search function of the program to locate all the text or image segments that fit a code label. In this way, the researcher can easily see how participants are discussing the code in a similar or different way.

- Computer programs help locate common passages or segments that relate to two or more code labels. The search process can be extended to include two or more code labels. For example, the code label "two-parent family" might be combined with "females" to yield text segments in which women are discussing a "two-parent family." Alternatively, "two-parent family" might be combined with "males" to generate text segments in which men talk about the "two-parent family." One helpful code label is "quotes," and researchers can assign interesting quotes to use in a qualitative report into this code label and easily retrieve them for a report. Computer programs also enable the user to search for specific words to see how frequently they occur in the texts; in this way, specific words might be elevated to the status of code labels or possible themes based on the frequency of their use. In another usage, a code label may be created for the "title" in the study, and the information in the label might change as the author revises the title in the process of conducting the study.

- Computer programs help make comparisons among code labels. If the researcher makes both of these requests about females and males, data then exist for making comparisons among the responses of females and males on their views about the "two-parent family." The computer program thus enables a researcher to interrogate the database about the interrelationship among codes or categories.

- Computer programs help the researcher to conceptualize different levels of abstraction in qualitative data analysis. The process of qualitative data analysis, as discussed earlier in this chapter, starts with the researcher analyzing the raw data (e.g., interviews), forming the data into codes, and then combining the codes into broader themes. These themes can be and often are "headings" used in a qualitative study. The software programs provide a means for organizing codes hierarchically so that smaller units, such as codes, can be placed under larger units, such as themes. In NVivo, the concept of children and parent codes illustrates two levels of abstraction. In this

way, the computer program helps the researcher to build levels of analysis and see the relationship between the raw data and the broader themes.

- Computer programs provide a visual picture of codes and themes. Many computer programs contain the feature of concept mapping so that the user can generate a visual diagram of the codes and themes and their interrelationships. These codes and themes can be continually moved around and reorganized under new categories of information as the project progresses.

- Computer programs provide the capability to write memos and store them as codes. In this way, the researcher can begin to create the qualitative report during data analysis or simply record insights as they emerge.

- With computer programs, the researcher can create a template for coding data within each of the five approaches. The researcher can establish a preset list of codes that match the data analysis procedure within the approach of choice. Then, as data are reviewed during computer analysis, the researcher can identify information that fits into the codes or write memos that become codes. As shown in Figures 8.3 through 8.7, I created templates for coding within each approach that fit the general structure in analyzing data within the approach. I developed these codes as a hierarchical picture, but they could be drawn as circles or in a less linear fashion. Hierarchical organization of codes is the approach often used in the concept-mapping feature of software programs.

In narrative research (see Figure 8.3), I created codes that relate to the story, such as the chronology, the plot or the three-dimensional space model, and the themes that might arise from the story. The analysis might proceed using the plot structure approach or the three-dimensional model, but I placed both in the figure to provide the most options for analysis. The researcher will not know what approach to use until he or she actually starts the data analysis process. The researcher might develop a code, or "story," and begin writing out the story based on the elements analyzed.

In the template for coding a phenomenological study (see Figure 8.4), I used the categories mentioned earlier in data analysis. I placed codes for epoche or bracketing (if this is used), significant statements, meaning units, and textural and structural descriptions (which both might be written as memos). The code at the top, "essence of the phenomenon," is written as a memo about the "essence" that will become the "essence" description in the final written report. In the template for coding a grounded theory study

Figure 8.3 Template for Coding a Narrative Study

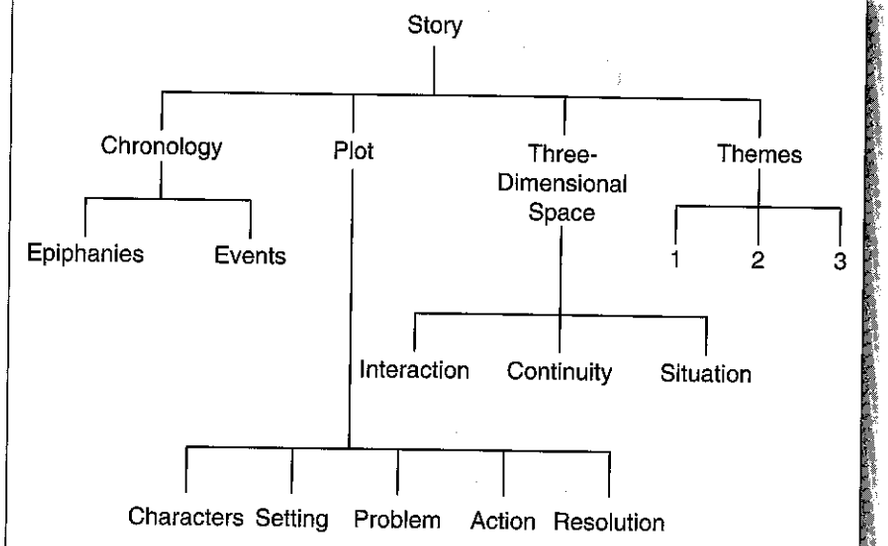
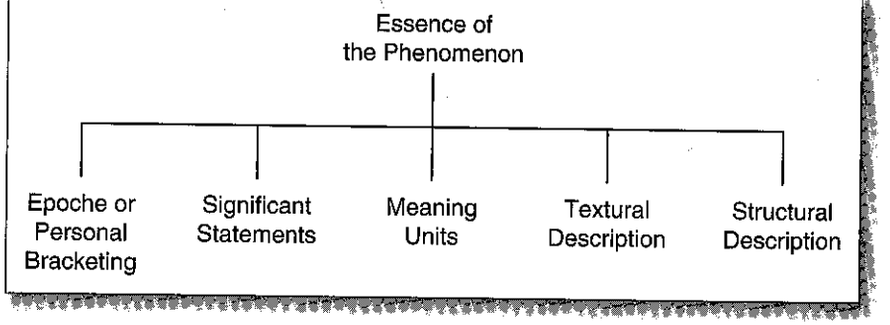


Figure 8.4 Template for Coding a Phenomenological Study



(see Figure 8.5), I included the three major coding phases: open coding, axial coding, and selective coding. I also included a code for the conditional matrix if that feature is used by the grounded theorist. The researcher can use the code at the top, "theory description or visual model," to create a visual model of the process that is linked to this code.

In the template for coding an ethnography (see Figure 8.6), I included a code that might be a memo or reference to text about the theoretical lens

Figure 8.5 Template for Coding a Grounded Theory Study

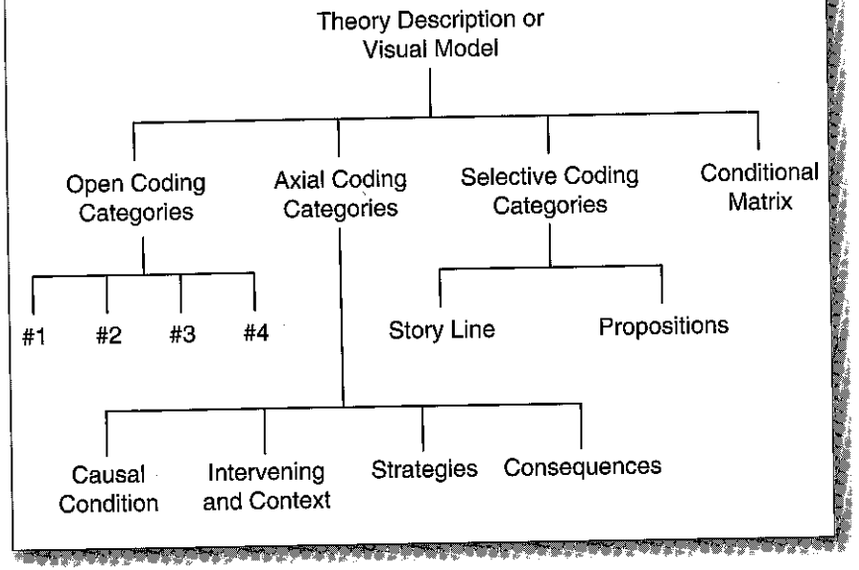
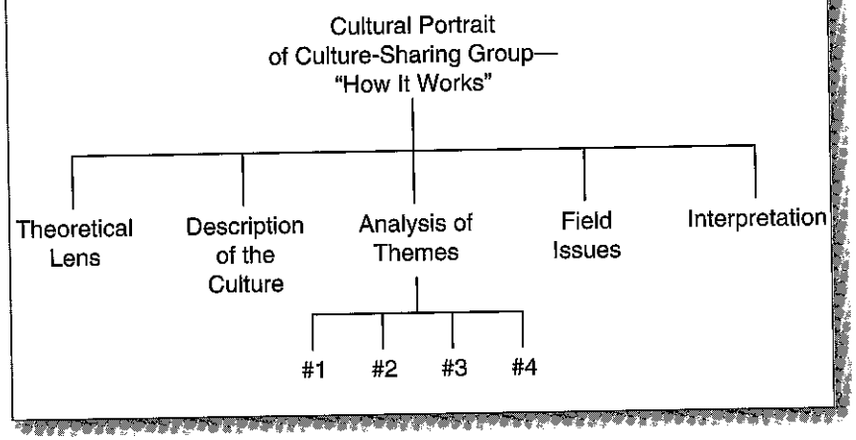
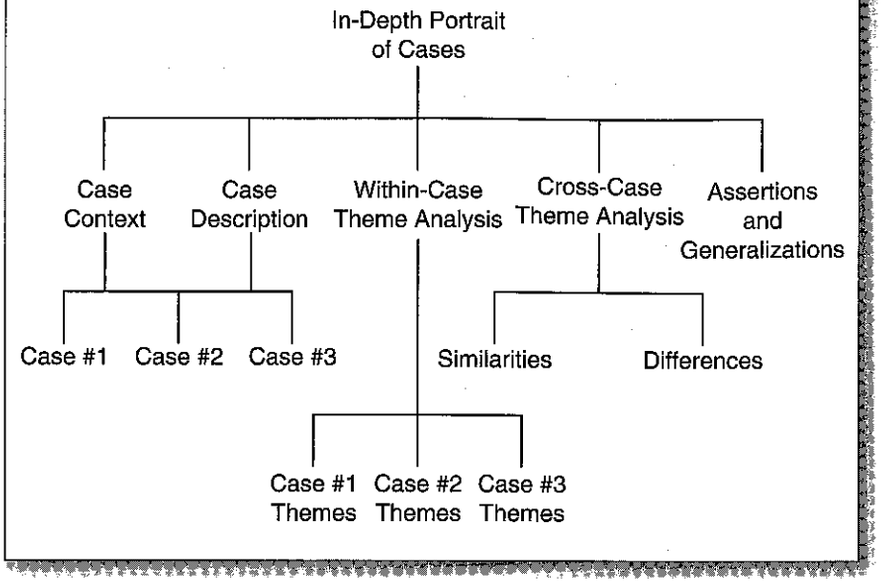


Figure 8.6 Template for Coding an Ethnography



used in the ethnography, codes on the description of the culture and an analysis of themes, a code on field issues, and a code on interpretation. The code at the top, "cultural portrait of culture-sharing group—'how it works,'" can be a code in which the ethnographer writes a memo summarizing the major cultural rules that pertain to the group. Finally, in the template for

Figure 8.7 Template for Coding a Case Study (Using a Multiple or Collective Case Approach)



coding a case study (see Figure 8.7), I chose a multiple case study to illustrate the precode specification. For each case, codes exist for the context and description of the case. Also, I advanced codes for themes within each case, and for themes that are similar and different in cross-case analysis. Finally, I included codes for assertions and generalizations across all cases.

How to Choose Among the Computer Programs

With different programs available, decisions need to be made about the proper choice of a qualitative software program. Basically, all of the programs provide similar features, and some have more features than others. Many of the programs have a demonstration copy available at their websites so that you can examine and try out the program. Also, other researchers can be approached who have used the program, and you can determine their views of the software. In 2002, I wrote a chapter with Maietta (Creswell & Maietta, 2002) in which we review several computer programs using eight criteria. As shown in Figure 8.8, the criteria for selecting a program were the ease of using the program; the type of data it accepted; its capability to read and review text; its provision of memo-writing functions; its processes of categorization; its analysis features, such as concept mapping; the ability of

the program to input quantitative data; and its support for multiple researchers and merging different databases. These criteria can be used to identify a computer program that will meet a researcher's needs.

Figure 8.8 Features to Consider When Comparing Qualitative Data Analysis Software

Ease of Integration in Using the Program

- Is it easy to use in getting started?
- Can you easily work through a document?

Type of Data the Program Will Accept

- Will it handle text data?
- Will it handle multimedia (image) data?

Reading and Reviewing Text

- Can it highlight and connect quotations?
- Can it search for specific text passages?

Memo Writing

- Does it have the capability for you to add notes or memos?
- Can you easily access the memos you write?

Categorization

- Can you develop codes?
- Can you easily apply codes to text or images?
- Can you easily display codes?
- Can you easily review and make changes in the codes?

Analysis Inventory and Assessment

- Can you sort for specific codes?
- Can you combine codes in a search?
- Can you develop a concept map with the codes?
- Can you make demographic comparisons with the codes?

Quantitative Data

- Can you import a quantitative database (e.g., SPSS)?
- Can you export a word or image qualitative database to a quantitative program?

Merging Project

- Can two or more researchers analyze the data, and can these analyses be merged?

Source: Adapted from Creswell & Maietta (2002), Qualitative research. In D. C. Miller & N. J. Salkind (Eds.), *Handbook of social research* (pp. 143–184). Thousand Oaks, CA: Sage. Used with permission.

SUMMARY

This chapter presented data analysis and representation. I began with a review of data analysis procedures advanced by three authors and noted the common features of coding, developing themes, and providing a visual diagram of the data. I also noted some of the differences among their approaches. I then advanced a spiral of analysis that captured the general process. This spiral contained aspects of data management; reading and memoing; describing, classifying, and interpreting; and representing and visualizing data. I next introduced each of the five approaches to inquiry and discussed how they had unique data analysis steps beyond the concept of the spiral. Finally, I described how computer programs aid in the analysis and representation of data; discussed four programs, common features of using computer software, and templates for coding each of the five approaches to inquiry; and ended with information about criteria for choosing a computer software program.

ADDITIONAL READINGS

Books on qualitative data analysis:

Marshall, C., & Rossman, G. B. (2010). *Designing qualitative research* (5th ed.). Thousand Oaks, CA: Sage.

Miles, M. B., & Huberman, A. M. (1994). *Qualitative data analysis: A sourcebook of new methods* (2nd ed.). Thousand Oaks, CA: Sage.

Specific data analysis strategies for each of the five approaches to inquiry:

Clandinin, D. J., & Connelly, F. M. (2000). *Narrative inquiry: Experience and story in qualitative research.* San Francisco: Jossey-Bass.

Czarniawska, B. (2004). *Narratives in social science research.* Thousand Oaks, CA: Sage.

Denzin, N. K. (1989). *Interpretive biography.* Newbury Park, CA: Sage.

Fetterman, D. M. (2010). *Ethnography: Step by step* (3rd ed.). Thousand Oaks, CA: Sage.

Giorgi, A. (2009). *The descriptive phenomenological method in psychology: A modified Husserlian approach.* Pittsburg, PA: Duquesne University.

Moustakas, C. (1994). *Phenomenological research methods.* Thousand Oaks, CA: Sage.

Riessman, C. K. (2008). *Narrative methods for the human sciences.* Los Angeles, CA: Sage.

Stake, R. (1995). *The art of case study research.* Thousand Oaks, CA: Sage.

Strauss, A., & Corbin, J. (1990). *Basics of qualitative research: Grounded theory procedures and techniques.* Newbury Park, CA: Sage.

van Manen, M. (1990). *Researching lived experience.* New York: State University of New York Press.

Wolcott, H. F. (1994). *Transforming qualitative data: Description, analysis, and interpretation.* Thousand Oaks, CA: Sage.

Yin, R. K. (2009). *Case study research: Design and method* (4th ed.). Thousand Oaks, CA: Sage.

For a review of computer data analysis programs in qualitative research:

Creswell, J. W., & Maietta, R. C. (2002). Qualitative research. In D. C. Miller & N. J. Salkind (Eds.), *Handbook of social research* (pp. 143–184). Thousand Oaks, CA: Sage.

Friese, S. (2012). *Qualitative data analysis with ATLAS.ti.* Thousand Oaks, CA: Sage.

Kelle, E. (Ed.). (1995). *Computer-aided qualitative data analysis.* Thousand Oaks, CA: Sage.

Weitzman, E. A., & Miles, M. B. (1995). *Computer programs for qualitative data analysis.* Thousand Oaks, CA: Sage.

EXERCISES

1. It is good to practice coding text data in a general sense before coding to develop an analysis within one of the five approaches. To conduct this practice, obtain a short text file, which may be a transcript of an interview, field notes typed from an observation, or an optically scanned text file of a document, such as a newspaper article. Next code the text by bracketing large text segments and asking yourself, "What is the content being discussed in the text?" Assign code labels to the text segments. Using information in this chapter, assign labels that match (a) what you would expect to find in the database, (b) surprising information that you did not expect to find, and (c) information that is conceptually interesting or unusual to participants and audiences. In this way, you will derive code labels that might be useful in forming themes in your study, and these procedures will direct you away from weak codes such as "positives" and "negatives."

2. Obtain some pictures from students or participants who are in one of your projects (or, alternatively, select some pictures from magazine articles). Practice coding these visual data. Begin by asking yourself, "What is occurring in the picture?" Assign code labels to these pictures looking again for (a) what you would expect to find in the database, (b) surprising information that you did not expect to find, and (c) information that is conceptually interesting or unusual to participants and audiences.

3. Gain some experience using a computer software program. Select one of the computer programs mentioned in this chapter, go to its website, and find the demonstration program. Try out the program. Often these demos will enable you to input a small database so that you can actually try out the features of the program. You might experiment with demos from different software programs.