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. Computers can assist in qualitative data analysis because the programs facilitate tasks—usually making them easier and faster to complete over time, but they are not necessary for completion. Patton (2015) notes the role of software in the process of analysis, saying while “many swear by it because it can offer leaps in productivity for those adept at it, using software is not a requisite for qualitative analysis. Whether you do or do not use software, the real analytical work takes place in your head” (p. 530–531).

In this chapter, we begin with a review of key ethical issues to anticipate during data analysis and representation processes followed by a summary of three general approaches to analysis so that we can see how leading authors follow similar processes as well as different ones. We then present a visual model—a data analysis
spiral—that we find useful to conceptualize a larger picture of all steps in the data analysis process in qualitative research. We use this spiral as a conceptualization to further explore each of the five approaches to inquiry, and we examine specific data analysis procedures within each approach and compare these procedures. We then discuss the use of computers in qualitative analysis—including weighing the advantages with the disadvantages. Finally, we 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 ethical issues may arise during data analysis?
- 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?

**Ethical Considerations for Data Analysis**

Among the challenges researchers encounter during the data analysis and representation process are ethical issues related to participant protection from harm and disclosure of comprehensive findings (see Table 8.1). This review, positioned in advance of specific analysis strategies, reminds us to carefully consider ethical issues across all approaches to inquiry (see initial discussion in Chapter 3). For the protection of participants, it is essential that researchers mask participant names as soon as possible to avoid inclusion of identifiable information in the analysis files. Researchers may also create composite profiles to avoid situations where participants might be identifiable in the reporting documents. During the disclosure of findings, it is researchers who embed member-checking strategies to enhance confidence in the data interpretations, a procedure to be discussed in Chapter 10 as a key validation step in research. Engaging participants in the data analysis may foster collaboration in how the data is interpreted and ultimately represented.
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. An important point to note is that 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 that are fundamental to all forms of qualitative research.

Table 8.2 presents typical general analysis procedures as illustrated through the writings of three qualitative researchers. We have chosen these three authors because they represent different perspectives. Madison (2005, 2011) 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 (1994) uses a more traditional approach to research from ethnography and case study analysis. These three influential 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
TABLE 8.2  General Data Analysis Strategies Advanced by Select Authors

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Taking notes while reading</td>
<td></td>
<td>Write margin notes in field notes.</td>
<td>Highlight certain information in description.</td>
</tr>
<tr>
<td>Sketching reflective thinking</td>
<td></td>
<td>Write reflective passages in notes.</td>
<td></td>
</tr>
<tr>
<td>Summarizing field notes</td>
<td></td>
<td>Draft a summary sheet on field notes.</td>
<td></td>
</tr>
<tr>
<td>Working with words</td>
<td></td>
<td>Make metaphors.</td>
<td></td>
</tr>
<tr>
<td>Identifying codes</td>
<td>Use abstract coding or concrete coding.</td>
<td>Write codes and memos.</td>
<td></td>
</tr>
<tr>
<td>Reducing codes to themes</td>
<td>Identify salient themes or patterns.</td>
<td>Note patterns and themes.</td>
<td>Identify patterned regularities.</td>
</tr>
<tr>
<td>Counting frequency of codes</td>
<td></td>
<td>Count frequency of codes.</td>
<td></td>
</tr>
<tr>
<td>Relating categories</td>
<td></td>
<td>Note relations among variables, and build a logical chain of evidence.</td>
<td></td>
</tr>
<tr>
<td>Relating categories to analytic framework in literature</td>
<td></td>
<td>Contextualize with the framework from literature.</td>
<td></td>
</tr>
<tr>
<td>Creating a point of view</td>
<td>Create a point of view for scenes, audience, and readers.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Displaying and reporting the data</td>
<td>Create a graph or picture of the framework.</td>
<td>Make contrasts and comparisons.</td>
<td>Display findings in tables, charts, diagrams, and figures; compare cases; compare with a standard case.</td>
</tr>
</tbody>
</table>

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. The practical application of many of these strategies were recently described and in some cases expanded upon by Bazeley (2013)—for example, how participants can be involved, the use of visuals, and the role of software. Madison (2011), however, introduces the need to create a point of view—a stance that signals the interpretive framework (e.g., critical, feminist) taken in the study. This point of view is central to the analysis in critical, theoretically oriented qualitative studies. Wolcott (1994), 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. Bazeley (2013) attributes success in data analysis to early preparation, cautioning “from the time of its [your research project] conception you will take steps that will facilitate or hinder your interpretation and explanation of the phenomena you observe” (p. 1). One of the challenges is making the data analysis process explicit because qualitative researchers often “learn by doing” (Dey, 1993, p. 6). 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, we 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 audiovisual materials (e.g., images, sound recordings) and exits with an account or a narrative. In between, the researcher touches on several facets of analysis and circles around and around. Within each spiral, the researcher uses analytic strategies for the goal of generating specific analytic outcomes—all of which will be further described in the following sections (see Table 8.3 for summary).

Managing and 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 digital files and create a file naming system. The consistent application of a file naming system ensures materials can be easily located in large databases of text (or images or recordings) for analysis either by hand or by computer (Bazeley, 2013). A searchable spreadsheet or
database by data form, participant, date of collection (among other features) is critical for locating files efficiently. Patton (1980) says the following:

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

Besides organizing files, researchers convert data and make plans for long-term secure file storage. Data conversion requires the researcher to make decisions about appropriate text units of the data (e.g., a word, a sentence, an entire story) and digital representations of the audiovisual materials. Grbich (2013) advises representing audiovisual materials digitally using a JPEG or pdf file of an image (e.g., photo, newspaper advertisement) or artifact (e.g., clay sculpture, clothing). It is important for researchers to carefully consider these early organizational decisions because of the potential impact on future analysis—for example, if the researcher intends to compare files, then how the individual files are initially set up and (if applicable) uploaded to a software program matter. For example, comparisons over chronological time or across multiple participants or across particular forms of data (e.g., interviews, focus groups, documents) are enabled or hindered by initial file organization. Computer programs help with file management and analysis tasks, and their role in this process will be addressed later in this chapter.
### TABLE 8.3  The Data Analysis Spiral Activities, Strategies, and Outcomes

<table>
<thead>
<tr>
<th>Data Analysis Spiral Activities</th>
<th>Analytic Strategies</th>
<th>Analytic Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Managing and organizing the data</td>
<td>Preparing files and units</td>
<td>File naming system and organizing database of files and units of text, images, and recordings</td>
</tr>
<tr>
<td></td>
<td>Ensuring ongoing secure storage of files</td>
<td>Creation of long-term file storage plan</td>
</tr>
<tr>
<td></td>
<td>Selecting mode of analysis</td>
<td>Use of software, by hand or hybrid</td>
</tr>
<tr>
<td>Reading and memoing emergent ideas</td>
<td>Taking notes while reading</td>
<td>Written memos leading to code development, reflections over time, and/or summaries across files or questions or project</td>
</tr>
<tr>
<td></td>
<td>Sketching reflective thinking</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Summarizing field notes</td>
<td></td>
</tr>
<tr>
<td>Describing and classifying codes into themes</td>
<td>Working with words</td>
<td>Naming of initial codes</td>
</tr>
<tr>
<td></td>
<td>Identifying codes</td>
<td>List of code categories and descriptions</td>
</tr>
<tr>
<td></td>
<td>Applying codes</td>
<td>Assign the codes to units of text, images, and recordings</td>
</tr>
<tr>
<td></td>
<td>Reducing codes to themes</td>
<td>Finalized codebook</td>
</tr>
<tr>
<td>Developing and assessing interpretations</td>
<td>Relating categories/themes/families</td>
<td>Contextual understandings and diagrams</td>
</tr>
<tr>
<td></td>
<td>Relating categories/themes/families to analytic framework in literature</td>
<td>Theories and propositions</td>
</tr>
<tr>
<td>Representing and visualizing the data</td>
<td>Creating a point of view</td>
<td>Matrix, trees, and models</td>
</tr>
<tr>
<td></td>
<td>Displaying and reporting the data</td>
<td>Account of the findings</td>
</tr>
</tbody>
</table>

### Reading and Memoing Emergent Ideas

Following the organization of the data, researchers continue analysis by getting a sense of the whole database. Agar (1980), for example, suggests 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). Similarly, Bazeley (2013) describes her read, reflect, play, and explore strategies as an “initial foray as into new data” (p. 101). Writing notes or memos in the margins of field notes or transcripts or under images helps in this initial process of exploring a database.
Scanning the text allows the researcher to build a sense of the data as a whole without getting caught up in the details of coding. Rapid reading has the benefits of approaching the text in a new light “as if they had been written by a stranger” (Emerson, Fretz, & Shaw, 2011, p. 145).

Memos are short phrases, ideas, or key concepts that occur to the reader. The role of the memoing process is described by the Miles, Huberman, and Saldaña (2014) definition. Memos are “not just descriptive summaries of data but attempts to synthesize in them into higher level analytic meanings.” (p. 95). Similarly, when examining digital representations of audiovisual materials, write memos of emergent ideas either on the digital representation or in an accompanying text file. Grbich (2013) suggests guiding the examination of the content and context of the material using the following questions: What is it? Why, when, how, and by whom was it produced? What meanings does the material convey? Guidance for the analysis of audiovisual data is available from general resources (e.g., Rose, 2012) in addition to specific forms of audiovisual data—for example, for images, see Banks, (2014); for film and video, see Mikos (2014); Knoblauch, Tuma, and Schnettler (2014); for sounds, see Maeder (2014); and for virtual data, see Marotzki, Holze, and Vertständig (2014).

Memoing procedures were used in the gunman case study (Asmussen & Creswell, 1995); first, the authors scanned all of the databases to identify major organizing ideas. Then, looking over his field notes from observations, interview transcriptions, physical trace evidence, and audio and visual images, the authors disregarded predetermined questions so they could “see” what interviewees said. They then reflected on the larger thoughts presented in the data and formed initial categories. These categories were few in number (about 10), and they looked for multiple forms of evidence to support each. Moreover, they found evidence that portrayed multiple perspectives about each category (Stake, 1995). Common to both of our analysis experiences, we have found memoing to be a worthy investment of our time as a means of creating a digital audit trail that can be retrieved and examined (Silver & Lewins, 2014). Using an audit trail as a validation strategy for documenting thinking processes that clarify understandings over time will be discussed in Chapter 10.

Here are some recommendations that guide our memoing practice (see also Corbin & Strauss, 2015; Miles et al., 2014; Ravitch & Mittenfelner Carl, 2016).

• Prioritize memoing throughout the analysis process. Begin memoing during the initial read of your data and continue all the way to the writing of the conclusions. For example, we recommend memoing during each and every analytic session and often return to the memos written during the early analysis as a way of tracking the evolution of codes and theme development. Miles et al. (2014) describes the urgency of memoing as “when an idea strikes, stop whatever else you are doing and write the memo. . . . Include your musings of all sorts, even the fuzzy and foggy ones” (p. 99; emphasis in original).

• Individualize a system for memo organization. Memos can quickly become unwieldy unless they are developed with an organizational system in mind. At
the same time researchers tout the usefulness of memoing, there is a lack of consensus about guiding procedures for memoing. We approach memoing so that the process meets our individualized needs. For example, we use a system based on the unit of text associated with the memo and creates captions reflective of content to assist in sorting. Three levels can be used in analysis:

- Segment memos capture ideas from reading particular phrases in the data. This type of memo is helpful for identifying initial codes and is similar to a precoding memo described by Ravitch and Mittenfelner Carl (2016).
- Document memos capture concepts developed from reviewing an individual file or as a way of documenting evolving ideas from the review across multiple files. This type of memo is helpful for summarizing and identifying code categories for themes and/or comparisons across questions or data forms.
- Project memos capture the integration of ideas across one concept or as a way of documenting how multiple concepts might fit together across the project. This type of memo is similar a summary memo described by Corbin and Strauss (2015) as useful for helping to move the research along because all the major ideas of the research are accessible.

- Embed sorting strategies for memo retrieval. Memos need to be easily retrievable and sortable across time, content, data form, or participant. To that end, dating and creating identifiable captions become very important when writing memos. Corbin and Strauss (2015) forward the use of conceptual headings as a feature for enhanced memo retrieval.

To conclude this section, we emphasize the complementary role memoing plays to systematic analysis because memoing helps track development of ideas through the process. This, in turn, lends credibility to the qualitative data analysis process and outcomes because “the qualitative researcher should expect to uncover some information through informed hunches, intuition, and serendipitous occurrences that, in turn, will lead to a richer and more powerful explanation of the setting, context, and participants in any given study” (Janesick, 2011, p. 148).

Describing and Classifying Codes Into 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, apply codes, 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 is central to qualitative research and involves making sense of the text collected from interviews, observations, and documents. 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. We think about “winnowing” the data here; not all information is used in a qualitative study, and some may be discarded (Wolcott, 1994). 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. We recommend proceeding differently with a short list—only expanding the list of initial codes as necessary. This approach is called lean coding because it begins with five or six categories with shorthand labels or codes and then it expands as review and re-review of the database continues. Typically, regardless of the size of the database, we recommend a final code list of no more than 25 to 30 categories of information, and we find ourselves working to reduce and combine them into the five or six themes that we will use in the end to write a 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. For audiovisual materials, identify codes and classify codes into themes by relating the material to other aspects of phenomenon of interest. Grbich (2013) suggests a guide for the coding process of audiovisual materials using the following questions: What codes would be expected to fit? What new codes are emergent? What themes relate to other data sources?

Figure 8.2 illustrates the coding process used to describe one of three themes (i.e., fostering relationships) from the analysis of 11 focus groups and three interviews with teachers, administrators, caregivers, and allied professionals for the purpose of supporting the educational success of students with fetal alcohol spectrum disorders (Job et al., 2013). This illustration shows the development of the theme beginning with the naming of three initial codes (i.e., attitudes, behavior, and strategies), the expansion from three to a total of six codes followed by the reduction to two final code categories (i.e., respectful interactions and candid communication). The description of the theme is organized in the published paper by the two final code categories (sometimes called subthemes) and the methodology includes a general description of the coding process without examples. This is not unusual practice for articles yet some dissertations include such examples in an appendix (for an example of a case study, see Poth, 2008).

Finalizing a list of codes and creating descriptions provides the foundation for a codebook (see Table 8.4 for an example). The codebook articulates the distinctive boundaries for each code and plays an important role in assessing inter-rater reliability among multiple coders (discussed in Chapter 10). A codebook should contain the following information (adapted from Bazeley, 2013; Bernard & Ryan, 2009):

- Name for the code and, if necessary, a shortened label suitable to apply in a margin
Description of the code defining boundaries through use of inclusion and exclusion criteria

Example(s) of the code using data from the study to illustrate

Table 8.4 illustrates the codebook used to guide the development of the theme, fostering relationships. This illustration provides a description of the boundaries for each of the two code categories (i.e., respectful interactions with one another, candid communication among stakeholders) using a definition, criteria guiding use, and example of a segment of text from the study. What we have found particularly helpful is criteria guiding use that refers to other codes; for example, in this instance, actions and preparation are codes for the second theme, reframing practices, and awareness and availability are codes for the third theme, accessing supports. The methodology of the published paper includes a general description of the inter-rater coding assessment procedures and outcomes without the guiding codebook. This is not unusual, as published papers do not typically include code lists, yet our experience as supervisors, members of supervisory committees, and examiners tells us that qualitative researchers often use a codebook and provide an example of it in an appendix.
Qualitative Inquiry and Research Design

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. This issue remains contentious as Hays and Singh (2012) declare, “quite a debated topic!” (p. 21) as 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 our own work, we may look at the number of passages associated with each code as an indicator of participant interest in a code, but we do not report counts in articles. This is because we, along with others (e.g., Bazeley, 2013; Hays & Singh, 2012), consider counting as conveying a quantitative orientation of magnitude and frequency contrary to qualitative research. In addition, a count conveys that all

<table>
<thead>
<tr>
<th>Theme</th>
<th>Code Name (shortened name)</th>
<th>Definition</th>
<th>When to use</th>
<th>When not to use</th>
<th>Example of a segment of text from study</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fostering relationships</td>
<td>Respectful interactions with one another (Respect)</td>
<td>Any evidence recognizing individual contributions as “mattering” or efforts that are valued</td>
<td>Use when interaction led to or hindered student success or trust/mistrust</td>
<td>When referring to outcomes—use actions or training—that is preparation</td>
<td>“This is their turf and I don’t [want to] go in there and impose my will on [them].”</td>
</tr>
<tr>
<td>Candid communications among stakeholders (Communication)</td>
<td>Any evidence referring to communication relevant for informing student success</td>
<td>Descriptions of timing, quality, and frequency of information sharing—reports, referrals, team meetings</td>
<td>When referring to supports—use awareness or availability</td>
<td>. . . we have to have [an] openness and . . . willingness to listen without being judgmental. And I think when that comes, everything else will . . . come too. But for right now, there are still too many people that are willing to judge. . . .”</td>
<td></td>
</tr>
</tbody>
</table>
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 our 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, we 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), names the researcher composes that seem to best describe the information, or from metaphors we associate with the codes (Bazeley, 2013). In the process of data analysis, we encourage qualitative researchers to look for code segments that can be used to describe information and develop themes. These codes can represent the following:

- Expected information that researchers hope to find
- Surprising information that researchers did not expect to find
- Conceptually interesting or unusual information for the researcher, the participants, or the audiences that is conceptually interesting or unusual to researchers (and potentially participants and audiences)

A final issue 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

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, we 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 our process involves winnowing the data, reducing them to a small, manageable set of themes to write into a final narrative. Among the key challenges for beginning qualitative researchers is the leap from codes to themes. We forward the following strategies for exploring and developing themes (inspired by ideas from Bazeley, 2013):

Use memoing to capture emerging thematic ideas. As you work with the data, write memos and include details about relevant codes. For example, an early project memo identified relationships as important in the study of educational success and it was not until later that how and what relationships needed to be fostered became clear from the coding process (Job et al., 2013).
Highlight noteworthy quotes as you code. In addition to its identification, include a description of why this quote was noteworthy. For example, include an initial code called noteworthy quotes simply for the purpose of keeping track of the quotes deemed as noteworthy. These “noteworthy quotes” can also inform the development of themes. Researchers can assign interesting quotes to use in a qualitative report into this code label and easily retrieve them for a report.
Create diagrams representing relationships among codes or emerging concepts. Visual representations are helpful for seeing overlap among codes. For example, use a network diagram of codes in ATLAS.ti (i.e., a qualitative software program) to visualize the relationships among codes and the concurrence tool to review possible overlaps among codes.
Draft summary statements reflective of recurring or striking aspects of the data. Noting recurrences or outliers in the data may help to see patterns between conditions and consequences.
Prior to transitioning to focus on the process of interpreting, it is important to recognize that some present thematic analysis as an alternative to coding. In our work, we emphasize the integral role of coding in the development of themes. This view is eloquently described by Bazeley (2013): “The consensus among those who seek to interpret, analyse, and theorise qualitative data, however, is that the development of themes depends on data having been coded already” (p. 191).

**Developing and Assessing Interpretations**

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). Patton (2015) describes this interpretative process as requiring both creative and critical faculties in making carefully considered judgments about what is meaningful in the patterns, themes, and categories generated by analysis. 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 (for further details about strategies for relating codes and connecting concepts, see the following: Bazeley, 2013; Ravitch & Mittenfelner Carl, 2016). 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.

As part of the iterative interpretative process, Marshall and Rossman (2015) encourage “scrupulous qualitative researchers to be on guard” (p. 228) for alternative understandings using such strategies as challenging ones’ own interpretations through comparisons with existing data, relevant literature, or initial hypotheses. Specific to audiovisual materials, develop and assess interpretations of the materials using strategies to locate patterns and develop stories, summaries, or statements. Grbich (2013) suggests guiding the interpretation using the following questions: What surprising information did you not expect to find? What information is conceptually interesting or unusual to participants and audiences? What are the dominant interpretations and what are the alternate notions?

The researcher might obtain peer feedback on early data interpretations or on their audit trail (discussed further in Chapter 10) and procedures. This can be helpful for assessing “how do I know what I know or think I know?” because it requires the researcher to clearly articulate the patterns they see in the data categories. A researcher might use diagramming as a way of representing the relationships among concepts visually at this point, and in some cases, these representations are used in the final reporting.
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 $2 \times 2$ table that compares men and women in terms of one of the themes or categories in the study or a $6 \times 6$ effects matrix that displays assistance location and types (see Miles & Huberman, 1994; Miles et al., 2014). The cells contain text, not numbers, and depending on the content, researchers use matrices to compare and cross-reference categories to establish a picture of data patterns or ranges (Marshall & Rossman, 2015). A hierarchical tree diagram represents another form of presentation (Angrosino, 2007). 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 8.3 illustrates the levels of abstraction from the gunman case (Asmussen & Creswell, 1995). 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.

![Diagram](draft-proof.png)

**FIGURE 8.3** Example of a Hierarchical Tree Diagram: Layers of Analysis in the Gunman Case

*Source: Asmussen and Creswell (1995).*
Given the variety of displays available to researchers, it can be difficult to decide which one works best. We forward the following guidance for creating and using matrix displays; we believe these strategies to be iterative and as useful for data displays beyond matrices (adapted from Miles et al., 2014):

- Search data and select level and type of data to be displayed. Begin by revisiting the research question and available data. Decide what forms and types of data will appear; for example, direct quotes or paraphrases or researcher explanations or any combination. Hand search data or use search functions within software to locate potential material. Maintain a log of inclusion/exclusion criteria as a way of keeping “an explicit record of the ‘decision rules’” (Miles et al., 2014, p. 116).
- Sketch and seek feedback on initial formatting ideas. Select labels for row and column headings as part of the initial sketching process. Be sure to balance amount and type of information because “more information is better than less” (Miles et al., 2014, p. 116). Ask colleagues to review your initial sketches and provide feedback about suggestions for alternative ways of displaying data.
- Assess completeness and readability and modify as needed. Look for areas of missing or ambiguous data, and if warranted, show this explicitly in the display. Reduce the number of rows or columns if possible—ideally no more than five or six is considered manageable—create groups within rows or columns or multiple displays as appropriate. Do not feel restricted by the formats you see, rather “Think display. Adapt and invent formats that will serve you best” (emphasis in original, Miles et al., 2014, p. 114).
- Note patterns and possible comparisons and clusters in the display. Examine the display using various strategies and summarize initial interpretations. The process of writing is essential for refining and clarifying ideas. Displays always need accompanying text as they “never speak for themselves” (Miles et al., 2014, p. 117).
- Revisit accompanying text and verify conclusions. Check that the text goes beyond a descriptive summary of the data presented and instead offers explanations and conclusions. Then verify the conclusions against raw data or data summaries because “if a conclusion does not ring true at the ‘ground level’ when you try it out there, it needs revision” (Miles et al., 2014, p. 117).

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. For additional ideas of innovative styles of data displays and guidance about how to best represent data from the analysis of audiovisual materials, see also Grbich (2013).
At this point, the researcher might obtain feedback on the initial summaries and data displays 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**

Think about the process of qualitative data analysis as having two layers. The first layer is to cover the processes we have described in the general spiral analysis. The second layer is to build on this general analysis by using specific procedures advanced for each of the five approaches to inquiry. These procedures will take your data analysis beyond a “generic” approach to analysis and into a sophisticated, more advanced set of procedures. Our organizing framework for this discussion is found in Table 8.5. We address each approach and discuss specific analysis and representing characteristics. At the end of this discussion, we return to significant differences and similarities among the five approaches.

**Narrative Research Analysis and Representation**

We 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 included several approaches to narrative analysis (Ollerenshaw & Creswell, 2002). 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 conducting interviews or having 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 (1989) suggests that a researcher begin biographical 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
<table>
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<tr>
<td>Reading and memoing emergent ideas</td>
<td>Read through text, make margin notes, and form initial codes.</td>
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<td>Read through text, make margin notes, and form initial codes.</td>
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<tr>
<td>Describing and classifying codes into themes</td>
<td>Describe the patterns across the objective set of experiences. Identify and describe the stories into a chronology.</td>
<td>Describe personal experiences through epoche. Describe the essence of the phenomenon.</td>
<td>Describe open coding categories. Select one open coding category to build toward central phenomenon in process.</td>
<td>Describe the social setting, actors, and events; draw a picture of the setting.</td>
<td>Describe the case and its context.</td>
</tr>
<tr>
<td>Developing and assessing interpretations</td>
<td>Locate epiphanies within stories. Identify contextual materials.</td>
<td>Develop significant statements. Group statements into meaning units.</td>
<td>Engage in axial coding—causal condition, context, intervening conditions, strategies, and consequences. Develop the theory.</td>
<td>Analyze data for themes and patterned regularities.</td>
<td>Use categorical aggregation to establish themes or patterns.</td>
</tr>
<tr>
<td>Representing and visualizing the data</td>
<td>Restory and interpret the larger meaning of the story.</td>
<td>Develop a textural description—“what happened.” Develop a structural description—“how the phenomenon was experienced.” Develop the “essence,” using a composite description.</td>
<td>Engage in selective coding and interrelate the categories to develop a “story” or propositions or matrix.</td>
<td>Interpret and make sense of the findings—how the culture “works.”</td>
<td>Use direct interpretation. Develop naturalistic generalizations of what was “learned.”</td>
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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. Daiute (2014) identifies four types of patterns for meaning-making related to similarities, differences, change, or coherence. 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. Embedded within narrative analysis and representation processes is a collaborative approach whereby participants are actively involved (Clandinin 2013; Clandinin & Connelly, 2000).

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 or 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 we see his modification of the Stevick–Colaizzi–Keen method as providing the most practical, useful approach. Our approach, a simplified version of this method discussed by Moustakas (1994), is as follows:

- 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 (horizontalization of the data) and treats each statement as having equal worth; and works to develop a list of nonrepetitive, nonoverlapping statements.
- Group the significant statements into broader units of information. These larger units, also called meaning units or themes, provide the foundation for interpretation because it creates clusters and removes repetition.
- Create 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.
- Draft 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), the authors provided 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.
- Write a composite description of the phenomenon. A composite description incorporates 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, and 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 Riemer (1986) tends to follow a structured analytic approach. In Riemer’s study of caring by patients and their nurses, she presents significant statements of caring and noncaring interactions for both males and females. Furthermore, Riemer formulates meaning statements from these significant statements and presents them in tables. Finally, Riemer 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, 2014) for use when two conditions for the possibility of doing phenomenological analysis are met with an appropriate question and data. First, the phenomenological question guiding the study is critical because “if the question lacks heuristic clarity, point, and power, then analysis will fail for the lack of reflective focus” (van Manen, 2014, p. 297). Second, the experiential quality of the data is necessary because “if the material lacks experiential detail, concreteness, vividness, and lived-thoroughness, then the analysis will fail for lack of substance” (van Manen, 2014, p. 297). 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) places 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 (van Manen, 1990, 2014). The process involved attending to the entire text (holistic reading approach), looking for statements or phrases (selective reading or highlighting approach), and examining every sentence (the detailed reading 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) and Corbin and Strauss (2007, 2015). 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 comprise 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 is 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 (Corbin & Strauss, 2015; Strauss & Corbin, 1990). Seldom have we found the conditional matrix actually used in studies.

A key to understanding the difference that Charmaz brings to grounded theory data analysis is to hear her say, “Avoid imposing a forced framework” (Charmaz,
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, 2014) 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, 2014) 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 a study of department chairs, theory is presented 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) present a discussion of a theoretical model as displayed in a figure with three phases. In the Harley et al. study, the analysis consists 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 and the planning methods.

**Ethnographic Analysis and Representation**

For ethnographic research, we recommend the three aspects of data analysis advanced by Wolcott (1994): description, analysis, and interpretation of the culture-sharing group. Wolcott (1990) 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 present only 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 (1994) 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 (1994), 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, 1994, 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 Mac an Ghaill and Haywood (2015) was guided by Braun and Clarke’s (2006) thematic analysis. The authors describe the group of Bangladeshi and Pakistani young men’s generational-specific experiences in relation to the racialization of their ethnicities and changes in terms of how they negotiated the meanings attached to being Muslim. The final section offered a broad level of abstraction beyond the themes to suggest how the group made sense of the range of social and cultural exclusions they experienced during a time of rapid change within their city. The authors situate their conclusions within their own experiences of listening to the group’s narratives over 3 years and resisting representing their identities
“using popular and academic explanations” (p. 111). Instead, they chose to emphasis the need for careful consideration and facilitation of ways for understanding the young men’s own participation and the influence of local contexts and broader social and economic processes in identity formation. Another example of an ethnography applied a critical perspective to the analytic procedures of ethnography (Haenfler, 2004). Haenfler provides 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 includes 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 (sXe) 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, we 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. For example, in Frelin’s (2015) case study (see Appendix F), she analyzed the information to determine what relational practices were successful within a particular school context—in this situation, a program for students who have a history of school failure. Another example, in the gunman case (Asmussen & Creswell, 1995), the authors sought to establish how the incident fit into the setting—in this 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 2x2 table, showing the relationship between two categories. Yin (2014) 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 for themselves, apply learnings to a population of cases, or transfer them to another similar context.

To these analysis steps we would add description of the case, a detailed view of aspects about the case—the “facts.” In Frelin’s (2015) case study (see Appendix F),
the illustrations of relational practices are organized chronologically describing how relationships were negotiated and the qualities trust, humaneness, and students’ self-images. The final section discusses the complex and temporal nature of teachers work in light of the literature about the population of students with experiences of school failure and considers the transferability of the findings related to teachers to the roles of school psychologists within similar contexts. To provide another account, in the gunman case study, we have access to greater details about the analytic processes (Asmussen & Creswell, 1995). The case description centers on the events following the gunman incident for 2 weeks and highlights the major players, the sites, and the activities. The data were then aggregated into about 20 categories (categorical aggregation) and collapsed into five themes. The final section of the study presents 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 dedicated to description, with the exception of grounded theory, in which the inquirer also 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. 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. Marshall and Rossman (2015) explain the role of software as qualitative analysis tool: “We caution that software is only a tool to help with some of the mechanical and management aspects of analysis; so the hard analytic thinking must be done by the researcher’s own internal hard drive!” (p. 228). Over time, the differing options of qualitative data analysis software and types of unique features have expanded considerably, making the selection of a program challenging for novice qualitative researchers. See Davidson and di Gregorio (2011) for a detailed historical description of qualitative data analysis software.

Computers in qualitative data analysis might be worthwhile to consider, yet it is also essential for researchers to be aware of their limitations. Among the key considerations, for those familiar with quantitative computer software programs, is the differences in expectations because in qualitative analysis, “such software cannot do the analysis for you, not in the same sense in which a statistical package such as SPSS or SAS can do, say, multiple regressions” (Weitzman, 2000, p. 805). The following sections will help you to become familiar with the available functions and options in for computer use in qualitative data analysis.

**Advantages and Disadvantages**

How the researcher intends to use the computer program for organizing, coding, sorting, representing the data interpretations is a key consideration. This is because, in our view, a computer program simply provides the researcher the means for storing the data and easily accessing the coded segments of data. We 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 does the following:

- **Provides an organized storage file system for ease of retrieval.** The researcher can easily manage data files, memos, and diagrams stored systematically in one place by creating a vessel in which to contain the project and bound the search. In our experience, this aspect becomes especially important in locating entire cases or cases with specific characteristics.

- **Helps locate material with ease for the purposes of sorting.** The researcher can quickly search and locate materials for sorting—whether this material is an idea, a statement, a phrase, or a word. In our experience, 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.

- **Encourages a researcher to look closely at the data.** By reading line by line and thinking about the meaning of each sentence and idea, the researcher engages in an active reading strategy. In our experience, without a program, the researcher is likely to casually read through the text files or transcripts and not analyze each idea carefully.

- **Produces visual representations for codes and themes.** The concept-mapping feature of computer programs enables the researcher to visualize relationships among codes and themes useful for interpreting. In our experience, interactive modeling features allows for exploring relationships and building theory through a visual representation that was often included in the final reporting.

- **Links memos with codes, themes, or documents for ease of reviewing.** A computer program allows the researcher to easily retrieve memos associated with codes, themes, or documents through the use of hyperlinks. In our experience, enabling the researcher to “see” the coded segments within the original document is important for verifying interpretations.

- **Enables collaborative analysis and sharing among team members.** A computer program facilitates access to analysis files and communication among team members who may be geographically dispersed. In our experience, without a program, researchers might complete work independently without a common purpose or use of common codes that are difficult to integrate.

The disadvantages go beyond their cost because using computer programs involves the following:

- **Requires a time investment for learning how to set up and run the program.** The researcher invests time and resources in learning 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. Working with different software may require learning different terminology and procedures. In our experience, we could get up and running the basic functions (files import, memoing) quickly across programs but found gaining proficiency in the specific search, retrieval, and diagramming features to be time consuming.

- **Interferes with the analysis by creating distance and hindering creativity.** Some researchers note concerns with positioning a machine between the researcher and actual data to producing an uncomfortable distance or hindering the creative process of analysis (e.g., Bazeley & Jackson, 2013; Gibbs, 2014; Hesse-Biber & Leavy, 2010). To mitigate some of these concerns, in our work with research teams, we have used a hybrid approach using computers for management and
eventually coding, but the initial code development was undertaken through making margin notes on paper transcripts.

- **Makes implementing changes, for some individuals, a hindrance.** Although researchers may see the categories developed during computer analysis as fixed, they can be changed in software programs—called recoding (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. In our experience, we like the ability to make changes efficiently but we are aware that some programs changes are difficult to undo.

- **Offers, for the most part, limited guidance for analysis.** Instructions for using computer programs vary in their ease of use and accessibility, although this is a growing area of interest with specific books and videos available to help the new learner. For example, see the discussion about computer applications in grounded theory (Corbin & Strauss, 2015), or with steps in pattern analysis (Bazeley, 2013).

- **Places the onus on the researcher to select appropriate programs for their needs.** The challenge for researchers is learning about the unique features offered by computer programs. In our work, we have found it sometimes difficult to predict what features will be most important. Gilbert, Jackson, and di Gregorio (2014) lament the focus on program choice when researchers are better served by asking, “what analytical tasks will I be engaged in, and what are the different ways I can leverage technology to do them well” (p. 221)?

A particular 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.

**How to Decide Whether to Use a Computer Program**

The range of software and techniques designed for qualitative analysis (often referred to as CAQDAS, an acronym for Computer Assisted Qualitative Data Analysis Software) offers something for everyone, yet the challenge remains whether to choose to use it. A useful resource is the CAQDAS Networking Project: http://www.surrey.ac.uk/sociology/research/researcheretmres/caqdas. Basically all processes involved in the data analysis spiral, discussed earlier in this chapter, can be undertaken by hand, using a computer or as a hybrid.

A review of introductory qualitative research texts revealed the majority address (at least cursively) the use of computer programs in qualitative analysis (e.g., Hays & Singh, 2012; Saldaña, 2013; Silverman, 2013). These authors describe the popular use of computer programs in qualitative data analysis. Kuckartz (2014) says, “Computer programs have been developed and are used fairly standardly in qualitative research. For over two decades, the field of computer-assisted analysis of qualitative data has been considered one of the most innovative fields in social science methodology development” (pp. 121–122). The ever-increasing number of available resources (e.g.,
texts, blogs, and videos) and reported use of a computer program in published papers (Gibbs, 2014) may make the decision easier for some. Resources have been developed specifically for giving an overview of the use of computer software programs in qualitative analysis (e.g., Kuckartz, 2014; Silver & Lewins, 2014). In this way, you can access the views of researchers about uses and experiences using software.

In Figure 8.4, we advance five questions for guiding whether to use a computer program for qualitative analysis: existing expertise in qualitative analysis; current level of proficiency with any programs; complexity of the study database; necessary program features for addressing study purpose; and configuration of the study researchers. These criteria can be used to identify whether using a computer program will meet a researcher’s needs.

**FIGURE 8.4 Five Questions to Guide Whether to Use a Computer Program for Qualitative Analysis**

1. What expertise do I bring to qualitative data analysis?
   a. Can I develop, apply, and sort codes into themes?
   b. Can I use themes to develop and verify qualitative data interpretations?
   c. What additional expertise do I need to develop in qualitative analysis?
   d. What additional resources do I need to invest in learning about qualitative analysis?

2. How proficient am I with any computer program in qualitative data analysis?
   a. Is the program I am familiar with optimal for addressing my study purpose?
   b. Can I use the program features for my particular approach?
   c. What additional training do I need to seek?
   d. What additional resources do I need to invest for learning a program?

3. How complex is my study database?
   a. What quantity of files will be included in my analysis?
   b. What types of data file formats will I use in my analysis?

4. What analyses features do I anticipate my study needing for addressing my study purpose?
   a. Will I compare among codes, themes, or files?
   b. Will I seek patterns among codes, themes, or files?
   c. Will I create diagrams or visual representations?
   d. Will I develop theory, stories, or understandings?

5. What is the anticipated researcher configuration for my study?
   a. Will I work as a team on the analysis?
   b. Will we merge analyses from multiple researchers?
A Sampling of Computer Programs and Features

There are many computer programs available for analysis; some have been developed by individuals on campuses, and some are available for commercial purchase. Several texts offer useful resources for reading about available computer programs; for example, Silver and Lewins (2014) describe seven different programs, and Weitzman and Miles (1995) review 24 programs. It is important to compare these programs in light of the differing logistics, functions, and features of the different approaches (see Table 11.1 in Guest, Namey, & Mitchell, 2013). We highlight four commercial programs that are popular and that we have examined closely (see Creswell, 2012; Creswell & Maietta, 2002)—MAXQDA, ATLAS.ti, NVivo, and HyperRESEARCH. We 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 for producing different types of conceptual maps representing theoretical associations, empirical relations, and data dependencies. Data can be exported to statistical programs, such as SPSS or Excel, and the software can import Excel or SPSS programs as well. Multiple coders on a particular project easily use it to collaborate. Images and video segments can also be stored and coded in this program. The mobile companion, MAXApp, allows researchers to use smartphones for data gathering, coding, and memoing, which can be directly transferred for further analysis. MAXQDA is distributed by VERBI Software in Germany. The Corbin and Strauss (2015) book contains an extensive illustration of the use of the software program MAXQDA to discuss grounded theory and 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. Freise (2014) offers a useful resource specific to the features offered by ATLAS.ti,
and a demonstration software package is available to test out this program, which is described by and available from Scientific Software Development in Germany.

**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, enables a researcher to use multiple languages, has a merge function for team research, and enables the researcher to easily manipulate the data and conduct searches. Further, it can display graphically the codes and categories. NCapture enables handling of social media data including profile data from Facebook, Twitter, and LinkedIn. A good overview of the evolution of the software from N6 to NVivo is available from Bazeley (2002) and a resource specific to using NVivo (Bazeley & Jackson, 2013). 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 and language 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 HyperTRANSCRIBE that will allow researchers to create a transfer of video and audio data. This program, developed by Researchware, is available in the United States.

**Additional programs to consider:**

**I. Commercial software programs**

- QDA Miner: http://provalisresearch.com
  - QDA Miner, developed by Provalis, was designed as qualitative software for mixed methods research.
- Qualrus: http://www.qualrus.com
  - Qualrus, developed by Idea Works, designed for managing and analyzing text, multimedia, and webpages.
- Transana: http://www.transana.org
  - Transana, developed by University of Wisconsin–Madison, for the qualitative analysis of video, audio data, and still images.

**II. Open source software programs:**

- Open code: http://www.phmed.umu.se/English/edpidemology/research/open-code
  - Open code, developed by Umea University in Sweden, was intended to follow the first steps of the grounded theory approach.
III. Web-based software:
   - Dedoose: www.dedoose.com
     o Dedoose, developed by SocioCultural Research Consultants, to meet the needs of research teams for working in real time.

Use of Computer Software Programs With the Five Approaches

After reviewing all of these computer programs, we see several ways that they can facilitate qualitative data analysis across the five approaches. Computer programs assist in the following:

- **Storing and organizing diverse forms of 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 RTF 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 image document and easily identifiable within the database.

- **Locating and sorting 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 or theme in a similar or different way.

- **Retrieving and reviewing 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.” The co-occurrence features highlight the frequency of the double coding. After reviewing the frequency of these code combinations, the researcher can use the search function of the program to search for specific words to see how frequently they occur in the texts. In this way, the researcher can create new codes or possible themes based on the frequency of the use of specific words describing the focus for each of the approaches—for example, patterns among story elements for narrative research, significant statements for phenomenology, properties representing multiple perspectives for grounded theory, group thought and behavior for ethnography, and instances for case study.
• **Comparing and relating 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. In this way, the researcher can easily retrieve the relevant data segments associated with these codes and categories during the development of themes, models, and abstractions relevant for each approach.

• **Supporting the researcher to conceptualize different levels of abstraction.** 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. Thus, contributing to the development of the story for narrative research, the description of the essence in phenomenology, the theory in grounded theory, cultural interpretation in ethnography, and the case assertions in case study.

• **Representing and visualizing codes and themes.** Many computer programs contain the feature of concept mapping, charts, and cluster analyses so that the user can generate a visual diagram of the codes and themes and their interrelationships. In this way, the researcher can continually move around and reorganize these codes and themes under new categories of information as the project progresses. Also, keeping track of the different versions of the diagrams creates an audit trail comprising of a log of the analytic process that can be revisited as needed (see Chapter 10 for further discussion).

• **Documenting and managing memos into codes.** Computer programs provide the capability to write and store memos associated with different units of data—for example, segments of text or images, codes, files, and the overall project. In this way, the researcher can begin to create the codebook or qualitative report during data analysis or simply record insights as they emerge.

• **Creating and applying templates 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 8.5 through 8.9, Creswell (2013) initially created these templates for coding within each approach that fit the general structure in analyzing data within the approach. He 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 8.5), we create 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 we 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 8.6), we used the categories mentioned earlier in data analysis. We placed codes for epiophes 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 (see Figure 8.7), we included the three major coding phases: open coding, axial coding, and selective coding. We 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 8.8), we included a code that might be a memo or reference to text about the theoretical lens 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 coding a case study (see Figure 8.9), we chose a multiple case study to illustrate the precode specification. For each case, codes exist for the context and description of the case. Also, we advanced codes for themes within each case, and for themes that are similar and different in cross-case analysis. Finally, we 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...
FIGURE 8.10  Nine Features to Consider When Comparing Qualitative Data Analysis Software

1. How easy is the program to integrate into your research?
   a. Is it easy to access in terms of cost and necessary operating system, available support and resources for learning the basics, and opportunities for further learning?
   b. Is it easy to use in getting started and working through an initial document?
   c. Are key features needed for the specific study easy to use?

2. What diversity of data file formats will the program accept?
   a. Will the program handle different types of text and audiovisual data?
   b. Will the program handle different languages (if needed)?
   c. Can the data files be changed once imported?

3. What reading and searching features does the program offer?
   a. Can I highlight data segments?
   b. Can I search for specific data segments?

4. What memo writing and retrieval features does the program offer?
   a. Can I add and access memos associated with data segments?
   b. Can I add and access memos associated with data codes, themes, and files?
   c. Can I add and access memos associated with the overall project?

5. What coding and reviewing features does the program offer?
   a. Can I develop codes?
   b. Can I easily apply codes to text or images?
   c. Can I easily display the data segments associated with individual codes?
   d. Can I easily review and make changes to the codes?

6. What sorting and categorizing features does the program offer?
   a. Can I sort for specific codes?
   b. Can I combine codes in a search?

7. What diagramming features does the program offer?
   a. Can I create a visual display of codes (i.e., network diagram, concept map)?
   b. Can I create a visual representation of a model or theory?

8. What importing or exporting features does the program offer?
   a. Can I import a quantitative database (e.g., SPSS)?
   b. Can I export a word or image qualitative database to a quantitative program?
   c. Can I export a code list with associated codes?
   d. Can I export visual displays and diagrams?

9. What merging, storing, and security features does the program offer?
   a. Can two or more researchers analyze data and then merge these analyses?
   b. Can a backup of the project files be easily created?
   c. What security features are available?


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for ease and fit. Also, guiding resources for specific programs are now available and other researchers can be approached who have used the program. In this way, you can draw upon the views and experiences of other researchers about the software. In 2002, Creswell and Maietta reviewed several computer programs using eight criteria. In Figure 8.10, we present expanded criteria for selecting a program: the ease of use; the diversity of data file formats it accepts; the capability to read and search text; the memo-writing functions; coding and reviewing; sorting and categorization features; diagramming functions, such as concept mapping; importing and exporting files; support for multiple researchers and merging different databases; and storage and security. These criteria can be used to identify a computer program that will meet a researcher’s needs.

### Chapter Check-In

1. Do you see the similarities and differences in how the authors describe data analysis procedures within their published qualitative studies? Select two of the qualitative articles presented in Appendices B through F.
   a. Begin with identifying evidence of the five data analysis spiral activities (summarized in Table 8.3) as they have been applied in each of the journal articles. Note which elements are easy to identify and which are more difficult to identify.
   b. Then compare the descriptions for each of the data analysis activities across the articles. Note which elements are similar and which are different.

2. What general coding strategies can you use to practice coding text to develop an analysis within one of the five approaches?
   a. To conduct this practice, obtain a short text file, which may be a transcript of an interview, field notes typed from an observation, or a digital file of a document, such as a newspaper article.
   b. Next, read and assign memos by bracketing large text segments and asking yourself the following questions:
      i. What is the content being discussed in the text?
      ii. What would you expect to find in the database?
      iii. What surprising information did you not expect to find?
      iv. What information is conceptually interesting or unusual to participants?
   c. Develop and assign code labels to the text segments using information
in this chapter and guided by such questions as the following:

i. What codes would be expected to fit?

ii. What new codes are emergent?

iii. What codes relate to other data sources?

d. Finally, revisit the segments assigned to each of the code labels and consider which ones might be useful in forming themes in your study.

3. What general coding strategies can you use to practice coding images to develop an analysis within one of the five approaches?

a. To conduct this practice, obtain pictures from one of your projects or select pictures from magazine articles and prepare a digital file.

b. Next examine the image and assign memos by asking yourself the following questions:

   i. What is in the picture?
   
   ii. Why, when, how, and by whom was it produced?
   
   iii. What meanings does the image convey?

   c. Develop and assign code labels to the image using information in this chapter and guided by such questions as the following:

   i. What codes would be expected to fit?

   ii. What new codes are emergent?

   iii. What codes relate to other data sources?

d. Finally, revisit the image segments assigned to each of the code labels and consider which ones might be useful in forming themes in your study.

4. What considerations should guide your use of qualitative data analysis software?

a. Using a qualitative study you want to pursue, apply the questions advanced in this chapter to guide whether to use a computer program (see Figure 8.4).

b. Using the questions to consider when comparing qualitative data analysis software in this chapter (see Figure 8.10), select a computer program or two that best fits your study needs.

   c. Go to the website of the selected computer programs, and find the demonstration program and resources to help you get started.

   d. Try out the program. If possible, input a small database to try out the program features related to memoing, coding, sorting, retrieving, and diagramming.

   e. Now, you might experiment with demonstrations from different software programs. Consider which one has the features that work best for you. Why?
Summary

This chapter presented data analysis and representation. We began by revisiting ethical considerations specific to data analysis followed by a review of procedures advanced by three authors and noted the common features of coding, developing themes, and providing a visual representation of the data. We also noted some of the differences among their approaches. We then advanced a spiral of analysis that captured the general process. This spiral contained aspects of using data management and organization; reading and memoing emergent ideas; describing and classifying codes into themes; developing and assessing interpretations; and representing and visualizing data. We next introduced each of the five approaches to inquiry and discussed how they had unique data analysis steps beyond the “generic” steps of the spiral. Finally, we described how computer programs aid in the analysis and representation of data; discussed criteria guiding how to decide whether to use and features specific to four programs; presented 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.

Further Readings

Several readings extend this brief overview introduction to data analysis, beginning with general resources and then specific for using qualitative data analysis software. The list should not be considered exhaustive, and readers are encouraged to seek out additional readings in the end-of-book reference list.

For Information About Procedures and Issues in Qualitative Data Analysis


Pat Bazeley provides a comprehensive description of analysis including illustrative examples of her practical strategies. This book should be essential reading because of its usefulness for a researcher at any level of expertise.


Handbooks offer diverse perspectives on a common theme as a starting place. Uwe Flick provides guidance about the basics of qualitative research, analytic strategies, and specific types of data.


Carol Grbich uses the background a researcher needs, the processes involved in research, and the displays used for presenting findings on which to organize this easy-to-read book. Noteworthy is her practical explanations related to coding (Chapter 21) and theorizing from data (Chapter 23).

In this foundational qualitative research text, Danico Hays and Anneliese Singh embed useful pedagogical features such as cautionary notes about possible research pitfalls. In particular, we found the data management and analysis descriptions and examples to be helpful.


In this edition, Johnny Saldaña has updated Matthew B. Miles and A. Michael Huberman’s seminal resource. In so doing, he has expanded the scope to include (among others) narrative inquiry and autoethnography. This text is a must-read for researchers.


In this classical work, Harry Wolcott describes the process of data analysis and representation using nine studies. He makes the case for the need for a good written description as a study outcome.

**For Information About Procedures and Issues About the Use of Qualitative Data Analysis Software**


Pat Bazeley and Kristi Jackson provide a comprehensive guide using examples to illustrate the use of NVivo features for getting started, coding, interpreting, and diagramming.


Udo Kuckartz, developer of MAXQDA, provides a good grounding in three types of qualitative text analysis—thematic, evaluative, and type-building—in addition to how computer analysis software can be embedded in the analysis process.


In this second edition, Christina Silver and Ann Lewins have expanded their excellent overview of how to optimize use of software into qualitative analysis with numerous examples. In particular, we found the summaries comparing seven software program features in Chapter 3 useful.