Chapter 12

Making Meaning From Your Data

FOCUS YOUR READING

■ In general, qualitative data analysis involves coding data and looking for themes and concepts.

■ Some researchers prefer to use narratives rather than themes.

■ Many researchers have moved beyond verbal data and use videos or visuals in their analyses.

Qualitative research takes time to constantly review where you are in the research process; what you have accomplished, what you have not accomplished, what challenges you have overcome and what new challenges you may have to deal with in the future. Once I was confident that I had captured my study participants' perceptions, then I organized, analyzed, and interpreted my data. I began writing my findings and observations as I went along. I found that presenting the feelings and perceptions of study participants can be difficult, especially when you are trying to be an objective observer and recorder of other people's thoughts, feelings, and perceptions. Capturing the experience through the images of your study participants requires good in-depth interviews, accurate transcriptions, and unbiased reporting. None of which is an easy task. A well-organized and conducted qualitative research study will enable you to make valuable contributions to the literature like these from my study.

—Warren Snyder

At this point in your study of qualitative research, you have had experience with conducting interviews, making observations, or writing reflexive journals. You realize that the type and quantity of the information you will gather (or have gathered) can be vast. But what are you to do with it? What does it all mean? How can you make sense of what you have learned? For unless you do something with all the information you have collected, you have not completed your research. It is now that you begin to consider more carefully, then, what you will do with it.

Let's start with some actual interview information. The following comments are taken from an interview with Neil Armstrong as part of the NASA Johnson Space Center Oral History Project. Stephen Ambrose and Douglas Brinkley conducted the interviews in 2001. The entire transcript covers more than 100 pages. As a reminder, Neil Armstrong was the first person to set foot on the moon. He was born in 1930 in Ohio.

Armstrong: I began to focus on aviation probably at age eight or nine, and inspired by what I'd read and seen about aviation and building model aircraft, why, I determined at an early age—and I don't know exactly what age, while I was still in elementary school—that that was the field I wanted to go into, although my intention was to be—or hope was to be an aircraft designer. I later went into piloting because I thought a good designer ought to know the operational aspects of an airplane. (p. 3)

Armstrong: Well, my knowledge of aerodynamics was not good enough to match the quality of the Wright Brothers' tunnel, and at that point I suppose I was equally educated to them. But it was a fun project. Blew out a lot of fuses in my home. [Chuckles] Because I tried to build a rheostat which would allow the electric motor to change speed and then get various air flows through the tunnel, not altogether successfully. (p. 4)

Ambrose: The assumption among young men at that time was, "As soon as I graduate or as soon as I get to be eighteen, I'm going into the service." But then the war ended when you were fifteen. So you completed the high school without any "I'm going to enlist" kind of feeling.

Armstrong: That's correct. We had a few people in my school who had either lied about their age or were a little older than the class, who had gone into the service, and came back and finished high school after the war was over. We had several of those fellows in our school, but the youngest of those would probably be two years older than I was. (p. 6)

Armstrong: Well, I always felt that the risks that we had in the space side of the program were probably less than we [had] back in flying at Edwards or the general flight-test community. The reason is that when we were out exploring the frontiers, we were out at the edges of the flight envelope all the time, testing limits. Our knowledge base was probably not as good as it was in the space program. We had less technical insurance, less minds looking, less backup programs, less other analysis going on. That isn't to say that we didn't expect risks in the space program; we certainly expected they would be there, were guaranteed that they would be there. But we felt pretty comfortable because we had so much technical backup and we didn't go nearly close to the limits as much as we did back in the old flight-test days. (p. 33)

The preceding dialogue includes several responses to questions posed by the interviewers. In one case, I also include the question. Let us continue to think about this. These brief selections and the remainder of the interview are your data. As a qualitative researcher, your task is to organize and make sense of the data. One way to do this is to see if you can identify key concepts that come out of the data. An alternate way to do this is to see if you can develop a story from the data. Whether key concepts or a story—both are legitimate ways of dealing with the data and making sense of it. There are a number of steps between the data and the key concepts or story.

First, let me provide some definitions. **Data** are the information you collect as part of your research study. In qualitative research, data usually take the form of words or pictures. (In quantitative research, they take the form of numbers.) **Key concepts** are derived from the data through a process of coding, sifting, sorting, and identifying **themes**. **Storytelling** or **narrative** is an alternate way of making sense of the data. As you can imagine, there are numerous steps along the way to move from the actual data you collected to either of these two ways of making sense of the data.

One of the first ways in which you manipulate the data is to assign codes to portions of the data. As a novice researcher, you will find it helpful to identify important portions of the text and choose several words to mark the data. We are going to try this now. Let's return to our original data.

> *Armstrong: I began to focus on aviation probably at age eight or nine, and inspired by what I'd read and seen about aviation and building model aircraft, why, I determined at an early age—and I don't know exactly what age, while I was still in elementary school—that that was the field I wanted to go into, although my intention was to be—or hope was to be an aircraft designer. I later went into piloting because I thought a good designer ought to know the operational aspects of an airplane. (p. 3)*

I want you to try some initial coding. Look at Armstrong's comments. How would you code his response? One choice might be [early interest in aviation]. Another might be [choosing career]. Your knowledge of Armstrong's background might come into play here as you proceed through the transcript. Let's try another bit of data.

> *Armstrong: Well, my knowledge of aerodynamics was not good enough to match the quality of the Wright Brothers' tunnel, and at that point I suppose I was equally educated to them. But it was a fun project. Blew out a lot of fuses in my home. [Chuckles] Because I tried to build a rheostat which would allow the electric motor to change speed and then get various air flows through the tunnel, not altogether successfully. (p. 4)*

How might you code this bit of data? [Sense of humor] might be used. Or you could tag [interest in aviation]. Notice that most of the codes are concerned with the topic or content of the response. One is concerned with the emotion shown by the respondent. Both are legitimate types of codes. Saldana (2009) has taken us even further in talking about coding attributes. I hope you

get the idea. You are beginning to move from the raw transcript data toward developing key concepts. You are at the very first stages—what Saldana called preliminary codes or jottings (p. 17).

Here is another selection from the interview. Try your hand at coding.

Ambrose: The assumption among young men at that time was, "As soon as I graduate or as soon as I get to be eighteen, I'm going into the service." But then the war ended when you were fifteen. So you completed the high school without any "I'm going to enlist" kind of feeling.

Armstrong: That's correct. We had a few people in my school who had either lied about their age or were a little older than the class, who had gone into the service, and came back and finished high school after the war was over. We had several of those fellows in our school, but the youngest of those would probably be two years older than I was. (p. 6)

Ambrose's comments might be coded [importance of service] or [caring about country] or [making career decisions]. You might find other terms to use to code his questions. Armstrong's comment could be coded [career choices] or [young age and career]. You can continue practice coding this very interesting interview by downloading it from the website provided at the beginning of the chapter. I hope you begin to see that preliminary coding involves moving from the raw data into identifying important elements. It is an iterative process and continuously shifts as you practice and become more familiar with your data.

■ Introduction

I have just taken you through the very beginnings of qualitative data analysis toward the pathway of developing themes and then key concepts. Later in this chapter, I take you through six steps to move from raw data into key concepts. Bazeley (2009) supported my view that analyzing qualitative data is more than just looking for themes that are supported with quotes drawn from the raw data. She thinks much deeper analysis should be involved that might include interpreting and naming categories or looking at pattern analysis. I also introduce you to the idea of narrative analysis in contrast to thematic analysis. I begin by asking you to think about what qualitative data are. Then I ask you to consider whether your analysis will involve looking for themes and key concepts or telling stories. Although many researchers have chosen to write about themes and concepts derived from the data, others use stories to convey meaning.

Next, I introduce the idea of data analysis as a process. What constitutes data? When should you do your analysis? How should you get started? What about coding and themes, or would you prefer to focus on the stories and narratives of those you study? How do you know when you are finished? Are you ever finished? I suspect that you will find those questions in any discussion of qualitative analysis.

Qualitative research uses an inductive strategy. Its purpose is to examine the whole, in a natural setting, to get the ideas and feelings of those being interviewed or observed. As a consequence, data analysis in qualitative research is also inductive and iterative. Some people like to collect data and analyze it simultaneously; the analysis can lead to further areas that could be investigated as the study continues. Others find that they collect the data and then begin the

analysis; while this is not advised, it often happens. You can make the process iterative by proceeding through the six steps that follow with some of your data and then testing it on additional data.

I see data analysis as being about process, and interpretation. Whether you analyze your data using statistics or choose some other method, there is a process you follow and interpretations to be made from that process. The process in quantitative research is straightforward—at least, once you determine what statistics to run. When I was in graduate school, the process was very difficult. You entered your data on 80-column cards and sorted the cards in the appropriate order. You wrote a program or selected a program to run your data, and you had your university run the program on a behemoth of a computer. How you interpreted the data you ran was also straightforward; it was primarily a matter of testing hypotheses and rejecting (or failing to reject) them. When personal computers replaced large mainframe computers, data analysis also changed. Several statistical programs (e.g., Statistical Packages for the Social Sciences and Statistical Analysis System) became available to analyze data. These and others are still in wide use today. The major issue for analyzing numerical data is to determine the appropriate statistics. Programs produce statistical output that can be used to test hypotheses. While you may not be entirely clear about which statistical approach to use or precisely how to enter your data, or even how to make meaning from your data once it is run, you might feel comfortable that the results you obtain are objective and scientific. You also expect that those who read your research will be comfortable with your results and find them objective and believable.

I suspect, however, that you are left somewhat dissatisfied when you try to organize your thoughts and put words to paper. What do those numbers really mean? Why are you rejecting the null hypothesis? Can you even be sure that you understand the null hypothesis? What does it mean to test at the .05 level of significance? To assist, you are usually able to obtain guidance from a professor or tutor, who can help you interpret what you did.

Using computer software for qualitative analysis, however, is not comparable to that available in the quantitative domain. In the example I provided about coding Armstrong's interview data, many computer programs would not be helpful in terms of identifying elements in the data that you deem important. Be aware, though, that there are some new techniques currently being tried that allow you to provide simple codes to data. I believe that it is only a matter of time before additional techniques become available.

Analyzing qualitative data is an entirely different matter. The data are not numerical. There are not agreed-upon ways of analyzing the data you have. And, whether you have a theoretical component to your research or not, you have the practical dilemma of doing something with the data. Most qualitative approaches provide very general information about how to do this. With the exception of grounded theory, you are pretty much left on your own. Thorne (2000) has reminded us that "qualitative data analysis is the most complex and mysterious of all of the phases of a qualitative project, and the one that receives the least thoughtful discussion in the literature" (p. 68). There is a lack of standardization and few universal rules. Basit (2003) commented that qualitative data analysis is the most difficult and most crucial aspect of qualitative research (p. 143). In 1994, Morse suggested that the actual process of analysis remains mysterious. Morse (2008) considered the issues of collaboration in qualitative inquiry and particularly commented that the researcher must "get inside the data," which makes collaboration somewhat problematic.

At times, investigators analyze the data using more than one method of analysis. Simons, Lathlean, and Squire (2008) described a study in which they used the same data set but two different

analysis protocols. First, they tried a thematic content analysis, in which they looked for themes across the data set based on content. Then, with the same data, they applied a narrative analysis. They described a technique developed by Riessman (2005) in which the analyst considered the social position of the narrator. Their conclusion was that using iterative and sequential methods reveal a greater depth of understanding than they would have found with only one method. Also, to take experimentation even further, Frost and his colleagues (2010) took the same interview transcript and conducted an analysis using four different analytic approaches: (1) grounded theory, (2) Foucauldian discourse analysis, (3) interpretative phenomenological analysis, and (4) narrative analysis. Kaufmann (2011) has described a poststructual analytic approach in which new meaning is created by looking for differences rather than similarities, by looking for absence rather than presence, and by looking at local rather than universal. Li and Seale (2007) reported on a project involving teaching and supervising their students in conducting qualitative analyses. Their students had difficulty knowing where to start coding, and they faced problems with ambiguities in definitions of codes, inaccuracies in reporting, and overinterpretation of the evidence. As my extensive experience and these studies suggest, how to analyze qualitative data is an area that remains conflicting or more likely somewhat vague. I have thrown many terms at you without any definitions or explanations. Now I want to bring you back to reality. We will look together at some ways you can make sense of the data you collect.

Whether you approach data analysis via a generic coding strategy or select one of several specific strategies—some of which I mention subsequently—and whether you use computer software or not, I believe you will have the most success with a systematic approach. A systematic approach to analysis and interpretation brings order and understanding to your qualitative research project. You will also need creativity and discipline as you embark on your data analysis. The challenge is that the way you do this is flexible and open to discussion and interpretation.

I also discuss clarification of your philosophical stance. What do you believe qualitative research can do with and for data? What is your belief regarding what I call "who is right"? Do you need to verify what you have done with an expert? After all, who is an expert? Should you connect to theory?

I then introduce a concrete example of what I refer to as the three Cs of analysis. This six-step approach should provide you with enough detail to start your own analysis.

Another topic I cover is whether, and in what ways, you should make use of computer software to analyze your data. Although most of you will have your data on your laptop computer, this is different from using analytical software. If you choose to use software, which program should you choose? How do you learn the software? Many faculty members are not qualified to assist you. Many of the instructional manuals cannot be used without additional workshops or tutoring. I conclude with new trends, especially in the area of secondary analysis.

Did You Know

? Steven Johnson (2004), in *Mind Wide Open,* helped us understand our inner workings and psyches in his fascinating book about the brain and the neuroscience of everyday life. By now, I shouldn't have to remind you that I want you to keep your mind wide open!

■ What Is Qualitative Data?

Most would agree that qualitative data generally take the form of words, not numbers. Modern writers include visual, audio, or graphic data in the definition, as well as verbal or textual data. While some argue that qualitative data can be transformed into quantitative data, I think it is those who practice a traditional or fundamentalist paradigm who take this position. If you support a more inclusive position, then almost any data you gather from, by, or about your study can be seen as qualitative data.

Suppose you are interested in studying single-sex classrooms. Some schools have adopted the practice of organizing classrooms by gender. There are merits and disadvantages on both sides. In a study involving British people born in 1958, Sullivan and her colleagues (2010) found this type of schooling positive for girls but neutral for boys. The American Civil Liberties Union opposes the idea, but advocates see that teaching can be targeted and distractions reduced.

You are interested in going beyond the statistical data. Let's look at the kind of qualitative data you might collect: interview data with students, teachers, and parents; observational data recorded in note form of classroom practices and student behaviors; documents related to the issues; shadowing of selected students; photographs or videos of students interacting; your notes regarding your thoughts about the practice; student work products, either on the computer or in hard copy; student chat room comments regarding their feelings about participating in this type of class; and your observations about the classroom's physical appearance and the appearance of the students. All are legitimate types of data. No one form of data is better or more legitimate or more meaningful than another type. You are limited only by your creativity and the available technology.

As you can imagine, you will have an enormous quantity of data in somewhat different forms. You will most likely transcribe your interviews and observational notes into a word processing program. You may have some data already on your computer, taken from chat room discussions or student work products. All your verbal data can be organized in a word processing program; you will have to devise a way to organize your visual or graphic data. Some qualitative software programs incorporate visual and audio data and provide ways to analyze them.

I want to stress that the data will be collected not at one time, but at several times across the life of your research project. In the same way, your analysis should cover the life of the project and should begin as you begin collecting your data. Planning how you will do your analysis should precede actual data collection. Let me emphasize that your plan should represent a general guide and may be modified as necessary, depending on the data you collect and the available tools for analysis.

■ When to Do Your Analysis

I see analysis as an ongoing process throughout the life of a project; however, we write about it in a linear fashion and often researchers get so involved in data collection that they do not begin any serious analysis until all data are collected. It would be ideal if researchers could follow a circular model of gathering and analyzing data. Often, a researcher will enter data into a computer program—a word processing program or qualitative software program—in concert with collecting additional data. Even when a researcher makes a decision not to conduct analyses using a computer, he or she organizes the data on the computer. Having entered the first piece of data—an interview, some field notes, or the current teaching unit—a researcher begins the process of analysis. Some do this informally while others proceed in a more formal manner.

■ Gaining Meaning: Themes or Narratives

In many traditions, there appears to be general agreement that the goal of analyzing the text and words collected is to arrive at common themes. Most procedures involve a process in which the researcher chooses to code words, phrases, segments, or other portions of text. Some people believe that the codes should be determined a priori. However, most take the position that the codes emerge from the data via a process of reading and thinking about the text material. Aside from a specific process identified with grounded theory, coding is usually done through a careful reading of the text. I have seen some people read the text and mark large chunks of material with codes. Others work from a microlevel and code text chunks or segments. Whatever the process, and I believe it varies by individual and perhaps even by type of data, the initial goal is to arrive at a manageable number of codes.

I see the process as one of organizing and categorizing. You begin with a large amount of material, for example, the text of an interview. That material is dissected and categorized into codes. Next, you proceed to a second interview. Again, dissect and categorize the data into codes; you can use the previous codes or add new codes. This iterative process continues until you have coded all your interviews. By this time, you have reviewed many interviews and coded them. You can now review your codes and look for ones that overlap or are redundant. You might find that you will rename some of your codes. You will likely generate many codes. These codes can then be organized into hierarchical categories, in which some codes will be subsets of larger categories. You might have 80 to 100 codes that you then organize into 15 to 20 categories and subcategories. These categories can then be organized into five to seven concepts. As a general rule, even large data sets do not reveal more than this small number of central and meaningful concepts about the topic of interest.

There are various ways to conceptualize data analysis in qualitative research. I want to discuss two of them: identifying themes and telling stories. Much of the writing about analysis deals with identifying themes. Here is the idea in a nutshell: You gather a large amount of data. It might come from one individual over time; it might come from several individuals; it might come from one or a number of settings; or it might be derived from other sources (chat rooms, interviews, observation notes). You might collect all the data or several people might collect data and combine the data. All data are gathered in order to answer your research questions. Now, the data are usually so large and disparate that they make no sense without some thought and organization. As a researcher, it is your task to provide those steps. I provide detailed information in the next section on steps you can follow to move from the data to development of themes and ultimately to meaning.

I see this as a process of sorting and sifting. Imagine that you have a large sieve. But it doesn't look like a traditional sieve. Some holes are square, some round, and some irregularly shaped. You put into the sieve a number of objects—some round, some square, and some irregularly shaped. You shake the sieve. The round ones drop through the round holes. The square ones drop through the square holes. Some of those irregularly shaped drop through the odd-shaped holes, while others stay in the sieve. You have sorted your objects based on a system. Some fit well while others do not. Or, think of how you could take items from the pockets of a group of children and put them into a large bin. Your assignment is to organize the items into three piles. Well, you might place edibles in one stack, games or toys into another, and items related to school into a third. Or, shifting

your thinking entirely, you might place disposables into one pile and those that are permanent into another. So, there is no right way to do this. And, you are no more or less expert at doing the task than the next person. Organizing the data you collect takes on the same kind of challenge. There are no clear rules, nor is it obvious how you should begin. As a beginning researcher, I suggest you begin by practicing. By following a process of coding and looking for themes, you can begin to make sense of your data.

One limitation of this type of analysis is that it operates from a reductionist perspective. Do we really believe that we can capture so much of what a person thinks and feels and portray it in five or six basic themes? Some would argue that by doing this, we are trying to move into an analytic mode that is more closely allied to principles of quantitative paradigms. An alternative approach to an analysis that identifies themes is the emphasis on finding the narrative or telling stories (Coffey & Atkinson, 1996). The intention is to examine how such stories can be used as structured or formal ways to transmit information. You can read in greater detail Denzin's (1989) account of interpretive biography. Connelly and Clandinin (1990) have written extensively on the topic. Baumgartner (2000), in her study of HIV-positive adults, shed light on exploring how stories can be used as a source of data. Although Richmond (2002) proposed some specific guidelines for a narrative analysis, most researchers follow their own plan and often do not describe details in their published work. Guy and Montague (2008) analyzed the personal narratives about men's friendships. Zilber, Tuval-Mashiach, and Lieblich (2008) stressed the importance of context in the construction and understanding of life stories. I particularly like Coffey and Atkinson's (1996) admonition:

> There are no formulae or recipes for the "best" way to analyze the stories we elicit and collect. . . . Such approaches also enable us to think beyond our data to the ways in which accounts and stories are socially and culturally managed and constructed. That is, the analysis of narratives can provide a critical way of examining not only key actors and events but also cultural conventions and social norms. (p. 80)

Some researchers have experimented with visual narratives. Researchers might rely on narratives generated by participants or those they generate. For details using this approach you can examine a Visual Research Methods course taught at the University of California, Berkeley, during the spring of 2011 (http://blogs.ischool.berkeley.edu/VizNarrative/potential-readings/). Others combine multiple types of data: visual, written, and spoken. Keats's (2009) point is well taken: "Studying narrative texts aids the researcher in understanding how participants experience, live, and tell about their world" (p. 181). Li and her colleagues (2011) have provided an excellent example of visual narrative combined with text.

I am suggesting that you can either conduct an analysis in which your goal is to identify themes or conduct an analysis in which your goal is to provide an interpretation of the data by telling or retelling a story. Neither way is "right." The process you follow to get to the end depends on your goal.

Writing about the analysis process is linear; in contrast, actually doing an analysis is anything but. You will be faced with many questions you need to answer and decisions to make. It is often the case that you know in advance the main types of data you will collect. However, as your project develops, you might discover that additional data become available. You may decide in advance

that you will use a computer software program to analyze your data. However, the program you want may not be readily available, or you may think you can learn how to run a program that turns out to be much more complicated than you anticipated. You may decide that you are going to concentrate on one aspect of a problem and then find that the data you collect lend themselves to exploring totally different arenas. You may decide to incorporate images in your data, but you are not really able to determine how best to include the visual data and how to incorporate them into an analysis. The process may appear to be relatively clear and systematic; however, in reality, you might find yourself getting bogged down in details you did not expect. You might find that you want to capture information from the Internet (e.g., chat room discussions, Listserv comments, the blogosphere, YouTube), but you do not know enough about the logistics to do this effectively. Shulman (personal participation, webinar, 2011) has developed Discover Text that enables the researcher to capture data from Facebook or Twitter in real time and apply preliminary codes.

■ Conducting an Analysis for Central Themes

The goal of qualitative analysis is to take a large amount of data that may be cumbersome and without any clear meaning and interact with it in such a manner that you can make sense of what you gathered. Again, you should not be surprised that there is no right way to do this. In fact, there is less written about the mechanics of doing such analysis than about any other topic in qualitative research. When authors do write about the process, they are quite vague. I propose here a process that I have used over many years. I suggest you think about it as a starting point, rather than a prescription. I hope you will find the ideas useful.

Getting Started

Qualitative research is usually a solo activity. You collect data on your own, analyze it on your own, write it on your own, and are responsible for what you say. But we know that much research benefits from interacting with others, trying your ideas out on others, and learning about the reaction of others to your ideas.

I know that students learn by doing and practicing. I encourage you to work with small groups of students as you embark on looking for meaning in what you have gathered. Here is an exercise from Barbara Kawulich (personal communication, 2008; exercise used with permission of Barbara Kawulich) that she calls "Hot Monkey Sex": Students are given three Post-it Notes each. On the first, they write their answer to the question "Given all the money you need, where in the world would you like to go for a month's vacation?" On the second, they write down whom they want to go with. On the third Post-it Note, they indicate what they want to do on the vacation. Students work in pairs to analyze the data by organizing the Post-it Notes in various ways to tell a story the responses generate. Kawulich chose the title for the exercise while working with a class consisting of several young teachers and one older, quiet teacher who typically did not get involved in the class. This activity really got the quiet teacher involved: Her Post-it Notes revealed that she wanted to go to Hawaii with Brad Pitt and have hot monkey sex. "The younger teachers roared with laughter, loving her openness and appreciating the fun-loving side we had never before seen." Kawulich reported that once she renamed the exercise, students would bring cameras to class because their friends wanted to see what "Hot Monkey Sex" looked like. Exercises like this can help you see how the codes emerge from the data and how no single scheme is better than another.

Preparing and Organizing Your Data

Once you have gathered some data, you need to put it into a format that is useful for analysis. In most cases, you will find a way to transcribe interviews, capture online discussions, or otherwise put words and text in a useful format. You should also think about visuals or audio that is not transcribed. I recommend that you place each item in a separate file, using a word processing package. It is helpful to insert your comments in brackets, and in a different font or color.

Make a folder and label it, for example, My Qualitative Research Project. You will place several files in this folder, depending on how much data you have collected. These files can be individual interviews and/or your observation notes or your researcher journal. At the very least, you will place your data and your journal files in the folder. It is helpful if you label each file in a systematic manner. For example, suppose you have four interviews: two with the same person and two additional ones. You would create the following four files: DonaldInt1, DonaldInt2, DavidInt1, DanielInt1. In a large project, you might have observation data as well: DonaldObs1, DavidObs1, and so on. Of course, your choice of file names depends on the type of data you collect. Some researchers like to incorporate a date in the file name.

In addition to these data files, you will want to create your researcher **journal**. Make another file and label it Researcher Journal. Some people also put information collected from a literature review in this folder. This folder should be created when you begin your research, not when you finish it. You should plan to keep adding to it as you move along.

Make sure you save a copy of this folder in a location other than your hard drive. In today's computer world, keeping copies of your files is somewhat easier than in times past. But I encountered a serious problem and lost an entire book chapter recently when my file became corrupted and I could no longer save it. An external hard drive became the savior.

Reviewing and Recording Your Thoughts

Most people find it helpful to read through all the material in their folders. In keeping with the iterative nature of the process, you can begin by reading a transcript. Add your thoughts and comments to your Researcher Journal file. It is okay to use informal writing here. Remember to date your notes. Your comments might look something like this:

> 9/15/2008. Read through the transcript of DanielInt1. Daniel certainly had a lot to say. I wish I had asked him more about why he decided to leave the field of teaching. I will need to remember to do that in my next interview and if I go back with him as well.

> 9/20/2008. Finished my second interview with Daniel. Glad he clarified his thoughts on this topic. Not sure I would have picked this up unless I had read what he said.

The Three Cs: Coding, Categorizing, and Concepts

You are now at a point where you can see how to move from raw data to meaningful concepts or themes. I call this the three Cs of analysis: from coding to categorizing to concepts.

Coding interview data, observational notes, and text into meaningful chunks is a challenging task. Whether you work with a word processing program or with other software, it is

your responsibility to generate the codes. Do not expect that a computer program will generate codes or organize them; rather, you will need to provide the input. I have broken down this process into six steps (see Figure 12.1).

Figure 12.1 Three Cs of Data Analysis: Codes, Categories, Concepts
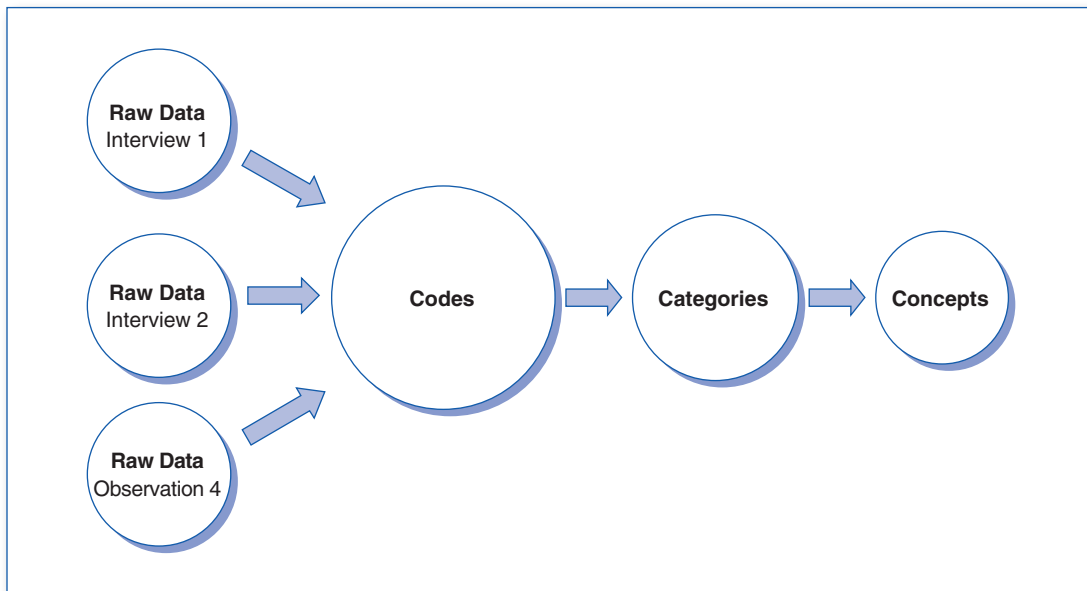
The six steps are as follows, and are subsequently explained in detail:

Step 1. Initial coding. Going from responses to summary ideas of the responses

Step 2. Revisiting initial coding

Step 3. Developing an initial list of categories

Step 4. Modifying initial list based on additional rereading

Step 5. Revisiting your categories and subcategories

Step 6. Moving from categories to concepts

Step 1. Initial coding. An initial code can be a word, a phrase, or the respondent's own words. You come to it by a careful reading of the text. In my coding of the Armstrong interview, I used brief phrases for my coding. Even if you have only collected a small amount of data, it is not too early to begin coding. Select any transcript. Read the initial page or two. Use the "Comment" function in your word processing program to insert your initial codes (in Microsoft Word, you will find the function on the "Insert" menu). Enter your initial codes. Continue reading the transcript while

entering different codes. Upon completion of initial coding with one transcript, select another transcript and continue the same process. Box 12.1 is an example that might help you see this more clearly. The researcher's codes are in brackets.

BOX 12.1 EXAMPLES OF INITIAL CODING

Transcript 1. Partial Interview: Cross-Gender Friendship

It was sophomore year in college. We knew each other—or at least who each other were—from freshman year. Sophomore year on the first day of classes, we met during some orientation. She was orientating freshmen. I was probably hanging around, looking for something or other to get into around campus. About four months after that we started hanging out constantly. [maintenance as friendship only]

We just—or at least I tried to—stay out of situations where it could have turned, become physical. [physical attraction] And we tried not to talk about it—those kind of things. [evolution into something more] After about eight months or so, things shifted. We both realized our feelings had changed. We tried to hold off as long as we could and keep the friendship as long as we could. But we started going to the next step. [potential problems]

One of the main things is that since I'm not actively seeing another person or actively engaged, is that when I meet a girl, any girl, is potentially more than a friend. [tensions/barriers]

Transcript 2. Partial Interview: Cross-Gender Friendship

Someone that I can talk to intimately. Someone that I can tell just about anything. [intimacy, talk to] … It's just a spark similar to physical attraction [physical attraction] but it's different. You know, when you talk to them that, you know, you may not agree on things necessarily, but you can understand each other. … natural progression. [something more]

Step 2. Revisiting initial coding. By now, you will have developed a large number of codes. Some of them will be redundant, and you will need to collapse them and rename the codes. I have observed that some people tend to code almost every phrase or sentence, while others code larger chunks of information. You need to choose whatever works best. You may want to modify your codes based on an examination of what you have already collected and new raw data. The brief transcript I provide does not give you a chance to show how you might rename your codes. But you should focus on removing redundancies, renaming synonyms, or clarifying terms. If you coded attributes, you should make them consistent, for example, men, boys, teenage boys, and so on. Choose one term to describe the attribute.

Step 3. Initial listing of categories. Now that you have modified your codes, it is time to organize them into categories. I have found that certain codes become major topics, while others can be grouped under a major topic and become subsets of that topic. In essence, you have moved from one long list of codes into several lists of categories, with related codes as subsets of the categories (see Box 12.2).

> ## Box 12.2 Example of Initial Categories
>
> (Subcategories have been omitted.)
>
> - Maintenance
> - Physical attraction
> - Intimacy
> - Tensions/barriers
> - Problems
> - Issues with boyfriend/girlfriend
> - Meaning of friendship
> - Issues of homosexuality

Step 4. Modifying the initial list. At this point, you will need to continue the iterative process. You may decide that some of your categories are less important than others, or you may see that two categories can be combined. Remember that your goal in the three Cs analysis is to move from coding initial data through identification of categories to the recognition of important concepts or themes.

Step 5. Revisiting categories. I suggest that at this point, you revisit your list of categories and see whether you can remove redundancies and identify critical elements. In my experience, most novice researchers tend to see everything as important. They appear reluctant to say that one area might reveal more interesting ideas than another. This is where you can exercise your judgment about what is important and what is not.

Here is an example taken from an entirely different context. Suppose you have 100 books and you want to arrange them into five piles. Well, there are a number of ways you can do this. You can sort by color—all blue-covered books together, all green-covered books together, and so on. You can sort by size—grouping all oversized books together. You can sort by topic—all books on science together, all books on humor together, and so on. Or you can sort by author—all books by Roth together, all books by Faulkner together, and so on. You could arrange by publication date— all books published after 2000 together, all from 1990 to 2000 together, and so on. Obviously, some categories make more sense than others, depending on your purpose. Further, you could place the books in subsets within each of the major categories. To continue with my example, you could place light blue books together, navy blue together, and so on. If you arranged by author, you could put major works together and minor works together.

Step 6. From categories to concepts. The final step in the process is to identify key concepts that reflect the meaning you attach to the data you collect. While there are no definitive rules for the number of concepts you might identify, I believe very strongly that fewer well-developed and supported concepts make for a much richer analysis than many loosely framed ideas. As you read and reread your data, you will see that some ideas appear richer and more powerful than others. It is up to you to determine that. I would suggest, as a rule of thumb, that five to seven concepts should be the maximum number that you can find in a set of data. You might consider even fewer

concepts as you become more sophisticated in conducting analyses. Obviously this number depends on the size of the data and the range of the interview. Some information is unimportant even though it is there.

When organizing your codes into concepts, it is your task to decide the most informative or logical manner of sorting. You need to determine from the data what meaning you think can be found. Sometimes your initial thoughts are quite superficial. You will find that reorganizing and rewriting and rethinking often lead to more powerful ideas. At this point, some writers like to weave information from the available literature together with their new data.

Strengthening the Process

By now, you will have completed the six steps in the movement from codes through categories to concepts. To add texture and depth to your analysis, you may want to return to your documents to look for other things that will enhance your interpretation. One promising area to explore is the use of metaphors. Our language is rich with metaphorical allusions and they often reveal much about what others mean. To what extent were metaphors used? Are there sufficient metaphors to incorporate as part of your written paper? If so, can you code them according to certain criteria that may emerge? You might look for type of language, metaphor chosen, or gender-related metaphors.

You could also explore the use of stories. To what extent were stories used? Are there stories that might lead to epiphanies? Are some better than others? Other kinds of things to look for in your data are the richness of detail, conflicting ideas from the same respondent, unusual or unique experiences, or ideas that contradict current thinking on the topic.

I want to reemphasize that making meaning from qualitative data is a process that moves between questions, data, and meaning. Figure 12.2 provides a summary of the data analysis process when looking for themes. Key elements in the model are that it is iterative, circular, and can be entered at any point. You need to try to think of your own work in this way as well.

Figure 12.2   Relationship Between Questions, Data, and Meaning
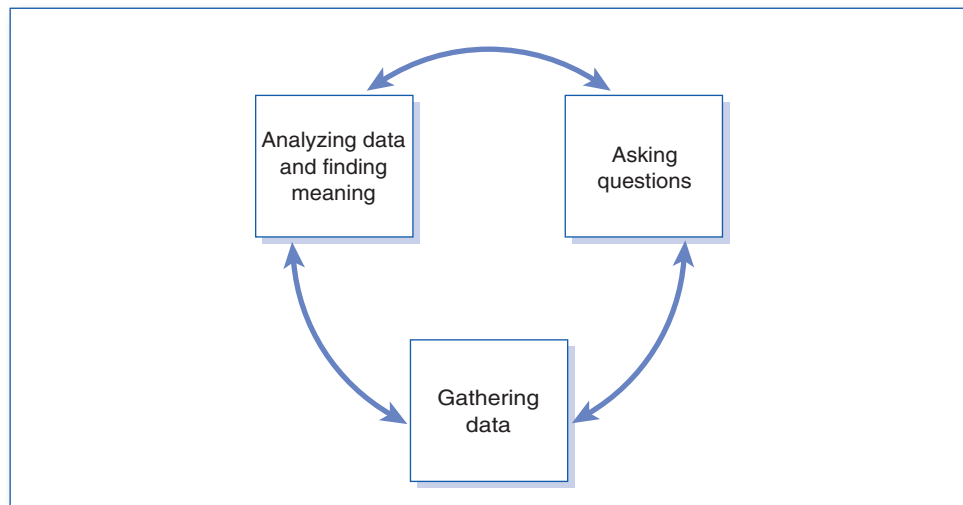
■ Analysis of Narratives

Thus far, I have described a process you can follow if you are analyzing your data by coding and looking for central concepts or themes. But some writers and researchers prefer an analytic procedure that focuses on stories and the narrative. Riessman (2008) wrote about narratives as telling, transcribing, and analyzing. She includes four analytic approaches: thematic analysis, structural analysis, dialogic/performance analysis, and visual analysis. According to Q: Foundations of Qualitative Research in Education (n.d.), a site developed for students at the Harvard Graduate School of Education,

> Thematic analysis relies on categorizing accounts or aspects of accounts that are being told. Structural analysis looks into the ways in which the narratives are structured and what the language in the stories does both on the textual as well as the cultural level. Dialogic/performance analysis focuses on the difficulty in analyzing accounts that are co-constructed or performed. Lastly, visual analysis focuses on the analysis of all visual media including art, video, and digital media. (¶ 3)

Langellier (1989) has added two additional categories: resolution (what finally happened) and coda (return back to the present). Richmond (2002) argued for the importance of studying stories. She studied adult learners by using a story map. You might find her four-step process helpful. The structure you use would include (1) an orientation (setting and characters), (2) an abstract (a summary of the events or incidents important in the story, (3) complicating action (your evaluative comments on events or conflicts or themes), and (4) resolution (the story outcomes). Paulson (2011) explained how she used open and focused coding in conjunction with two types of data (ethnographic and narrative interviews) in her study about dance. For me, this is an example of blurred lines. While it is a study based on narrative, she follows quite explicit and detailed coding procedures.

My original task was to help guide you, in detail, on how to analyze your data so that you could develop and write in a narrative, storytelling manner. Saldana (2009) has offered an example of narrative coding. He spoke of how narrative coding emerged after looking at the structures and properties of an interview (p. 110). While helpful, the specific details of how one moves from the raw data into a narrative or story mode is based more on the whole of the data rather than isolating each part into specific codes. In a sense, the process is about the whole rather than a focus on the details. That is not to make a judgment about the value of this approach. There is a large increase in presentations that are based on autoethnography, poetry, performances, and storytelling. You will find many such examples in the journal *Qualitative Inquiry*. The June 2011 issue, for example, includes 10 articles; there are plays, poetry, autoethnography, and performance text. One includes visuals. None are written in the more familiar style. The April 2011 issue follows a similar pattern.

While there is some writing about narrative analysis, very little of it addresses any specifics on how to do it. In fact, Griffin (2011), in a review of Goodall's 2008 volume on writing qualitative inquiry and storytelling, commented "but though it is a rapidly growing area, there is a dearth of practical advice regarding personal narrative as a method of inquiry" (p. 219).

I presented two types of analysis: theme analysis and narrative analysis. In the section on theme analysis, I provided you a six-step process to move from raw data to themes (and concepts). This process is generic in nature, but incorporates ideas from many different research approaches and analysis approaches. I also discussed in an abbreviated manner the idea of analyzing based on narrative or storytelling. What follows are two sections. In the first, I talk about the major qualitative research approaches I described in Chapter 4. In the second, I discuss various analytic techniques that sometimes stand on their own.

■ Qualitative Research Approaches

I find it very frustrating to try to describe specifically how to conduct analyses. On the one hand, I presented you with a number of major qualitative research approaches earlier in this book. Most of these do not focus on the analysis of the data. Almost all of the material you read will leave you with more questions than answers. It would be very nice if each research approach had a specific data analysis technique associated with it. But that is not the case. It is almost as though qualitative analysis techniques came about independent of research approaches. With the exception of grounded theory, most of the other research approaches are vague with respect to analysis. But to try to help you get a better understanding of research approach and analytic technique, I want to comment briefly on how the various research approaches you learned about in Chapters 4 and 5 connect with different types of data analysis techniques.

If you were following an ethnographic approach, no specific guideposts are suggested, but you would focus on an understanding of the culture. Often, your data includes field notes based on observations. You might also have data from informal interviews. You probably will have visual data as well. Your analysis will typically involve coding and looking for themes. The process I described earlier can be used if you were doing ethnography.

If you were following a grounded theory approach, you would follow a very specific three-part coding approach: open, axial, and selective. This is also referred to as the *constant-comparative method*. If you choose this approach, it would be helpful to review Strauss and Corbin's (1990) detailed explanation for this multistep coding process. You could also look closely at Charmaz's (2006) text. Also see the discussion under constant-comparative method.

If you were following a phenomenological tradition, you would be interested in the lived experiences of the individuals. You will need to explore some of the philosophical underpinnings of phenomenology, and your data analysis would be facilitated if you bracketed your views. You might choose to conduct either narrative analysis or thematic analysis.

If you were following a case study approach, you might use single cases and then multiple cases treating each case separately and then comparing cases. Some analysts use cross-case comparisons.

If you were following a feminist tradition, you would concentrate on examining power disparities.

If you were following a generic approach, you would look for general themes or use narratives.

If you were following narrative analysis, or biographical, autobiographical, or life history traditions, you might concentrate on the gathered stories and narratives and look for epiphanies. You might choose narrative, content, conversation, or discourse analysis.

If you were following a postmodernist or critical theoretical approach, you might look at issues of sexuality and gender. Because these approaches are more theoretical than practical, analyses are very general.

If you were using mixed methods, you would tend to organize your data and construct tables as well as look for themes.

Perhaps the preceding discussion simply highlights the lack of clarity between qualitative research approaches and how to conduct an analysis. At times, you will see references to very specific qualitative analytic techniques. I list and give examples of some of the major ones.

■ Qualitative Analysis Techniques or Procedures

Just as various disciplines have influenced the approaches qualitative researchers take in designing their research and gathering data, so, too, have a variety of disciplines influenced ways in which such researchers deal with their data. Saldana (2009) has taken a somewhat different approach. His work provides very detailed information about all types of coding. He suggested that there are first and second cycle coding methods. First cycle methods include a number of subcategories (e.g., grammatical, affective, and exploratory). Second cycle methods are concerned with classifying, integrating, and conceptualizing. His very detailed manual provides numerous specific examples for coding using various kinds of methods. Here are just a few examples drawn from his text. Most of us think about coding for a particular topic or content. Saldana calls this *descriptive coding*. But you might also code for attributes, where you identify age, gender, or marital status. What Saldana allows us to see is that first-level coding can be along a number of dimensions—not just content or topic. I find this helpful as I explore coding steps. As I mentioned, few research designs provide specifics about analysis procedures, while others are either silent or very general. Next, I list some of the major analytic techniques.

Generic approach. Although there are a number of specific analytic techniques associated with various research approaches, many qualitative researchers use a **generic approach to coding**. The procedure I outline previously is a generic style. Creswell (2009) has stated this cogently: "Often we see qualitative data analysis reported in journal articles or books that is a generic form of analysis. In this approach, the researcher collects qualitative data, analyzes it for themes or perspectives, and reports 4–5 themes" (p. 184). For Saldana (2009), generic coding (both first and second cycle) includes attribute coding and descriptive coding as well as coding for patterns. I reviewed a number of qualitative research studies to determine the approach used. Many discussed coding and looking for themes, but did not discuss details of how the coding was accomplished or how the themes were derived from the codes.

Constant-comparative method. The **constant-comparative method** is an analytic procedure closely associated with grounded theory. Its steps involve open coding, axial coding, and selective coding. Open coding is the first step—raw data are examined to begin to develop names and categories. Axial coding is the second step of the constant-comparative method. Moving from the open codes, the researcher relates the initial codes to one another. Finally, the researcher applies selective coding in which choices are made regarding the most important codes. A hierarchy is developed and one or a small number of codes are chosen to represent the key concepts drawn from the raw data. Ultimately,

theory is derived from the concepts. Strauss and Corbin (1990) have provided specific examples of how to use this procedure. Charmaz (2006) also takes you through some of the details. Kirchhoff and Lawrenz (2011), in their study of teacher education, provided an excellent and detailed explanation of how to do such coding. Allen (2011) applied the method in her feminist approach to grounded theory. This detailed procedure involves line-by-line coding from which concepts appear. Her article offers examples of the raw data, the initial codes, and the focused codes. Eich (2008) provided more details of how to use this method in his grounded theory study of student leadership development programs. Connolly (2003) has adapted and simplified this method, which she refers to in general terms as *qualitative data analysis*. She identifies three phases: generative, interpretive, and theorizing.

Content (textual) analysis. **Content analysis** has been around since Lasswell introduced the idea of studying the content of communication. Krippendorff wrote about it in 1980 (see also Krippendorff, 2004). Some qualitative researchers are drawn to it, I suspect, because it has a structure and is more in keeping with the position of looking for rigor and acceptance. Hsieh and Shannon (2005) identified three approaches to content analysis. In what they called a conventional content analysis, coding categories were derived directly from text. In a direct approach to content analysis, a theory or prior research is used to guide the analysis in the initial coding. A third type is summative analysis; in this latter approach, counting categories precedes the interpretation. It seems to me that these three approaches are a continuum, from less to more conservative. Denny (2011) used content analysis to explore gender differences in the messages of handbooks and other material from boy and girl scouts. She was interested in the content, the context, and the approach. I found the variety of information she coded fascinating. For example, she looked at badges and badge activities for boys and girls. I was surprised to learn that there were 20 badges and 323 activities for boys and 104 badges and 1440 badge activities for girls. So, you can see the process was very detailed and tedious. Sonpar and Golden-Biddle (2008) used content analysis of qualitative archival data to elaborate on theories of adolescence.

Conversation analysis. As its name implies, **conversation analysis** is a detailed analysis of the talk between two or more individuals. Coming from the field of sociolinguistics, the careful study of talk was originally started by Sacks, and you can view an online tutorial (Antaki, n.d.; www -staff.lboro.ac.uk/ssca1/intro1.htm). You might also find Belouin's (2010) blog helpful in understanding this approach.

Discourse analysis. **Discourse analysis** is a technique with several interpretations. It was originally interpreted as analyzing structure of text content in terms of syntax and semantics. When influenced by poststructural or postmodern views of the world, this procedure "is concerned with the way in which texts themselves have been constructed in terms of their social and historical 'situatedness'" (Cheek, 2004, p. 1144). Prins and Toso (2008) employed discourse analysis in their analysis of a widely used parent profile instrument. Freshwater and her colleagues (2010), writing in the field of nursing, were concerned with qualitative research as evidence and presented clear discussions about ways in which discourse analysis coupled with autoethonography can be seen to have suitable rigor and relevance. Foucauldian discourse analysis emphasizes power relationships and subjectivity. Garrity (2010) discussed the complexity of some of these issues and urges considering some of the complexities of the theory.

Interpretative phenomenological analysis. This analytic approach involves the detailed examination of the lived experience of individuals. It is influenced by hermeneutics. Owens and her colleagues (2011) applied the approach in a study of urban African American males' perceptions of school counseling services.

Narrative analysis. Based on the idea that people use stories to make sense of themselves, this type of analysis explores the data specifically looking for stories. While early narrative analysis relied on Labov's (1972; Labov & Waletzky, 1967) writing, Cortazzi (2002) developed later work in education. Spector-Mersel (2011) has helped us understand ways in which narratives can be interpreted. Her model relies on the idea that identities can be claimed via stories. Later in this chapter, I discuss the importance of interpreting stories informants tell. Her article used life stories of senior officers who come from the generation of those who founded Israel in the 1940s. But you can see how this might be applied to a study of baby boomers who are preparing to retire from the field of education.

Qualitative comparative analysis (QCA). Ragin (1987) developed QCA when dealing with comparison across cases. According to Greckhamer, Misangyi, Elms, and Lacey (2008), its purpose is to preserve the complexity of a single case while making comparisons across cases. It has primarily been used in sociology and political science and is more closely associated with conservative or traditional approaches to qualitative analysis.

I believe that many of these analytic approaches were developed to systematize the analysis of qualitative data. All assume that the data are represented by words. They are not as well established as quantitative procedures and, as you can see, current researchers are still modifying many of the techniques. My philosophy is that, unless you are following a grounded theory approach, you will be best served by using a generic approach and following the steps I outlined earlier in the chapter. Perhaps the last word on coding comes from Woodby and her colleagues (2011), who wrote about the emotional stress of coding on the researchers as they worked with after-death interviews of family members. This led them to write about how qualitative inquiry can impact the emotional well-being of researchers. This may seem a little extreme, but then again, I didn't do the type of coding they did.

■ What About Transcribing?

There is considerable discussion in the literature, on Listservs, and on the Internet about transcribing interviews. Some want to know whether they need to transcribe their interviews. In one such interchange in May 2011, a user asks whether the audio can be used directly. Several respondents assure him that qualitative data analysis (QDA) packages are available and audio and transcript information can be synched. Most researchers agree that interviews need to be transcribed. Davidson (2010), in a study of the conversation of young children, wrote in detail about the need for transcription, especially since she was conducting a conversation analysis. Some think the researcher needs to do it directly; others concede that someone else might perform the task. In either case, it is generally recommended that the actual words should be used. For some analyses, it is critical.

Hammersley (2010) raised a different point. He suggested that using actual transcriptions is a more rigorous type of evidence than field notes because it offers a more accurate representation of what happened. He is also interested in capturing a description of behaviors.

Some equipment on the market that transcribes audiotapes is not yet perfected. (See Johnson, 2011, for his comparison of voice recognition software with listen-and-type method. His conclusion is that the latter method takes less time and is more accurate.) Perhaps, by the time you begin your research, better equipment will be available. But for now, you will need to transcribe your interview data—not write a summary. This is, of course, time consuming and quite difficult, especially if you have focus group data. Some will hire a person to transcribe their data, but, in my view, it is worth the effort to do it on your own. Bailey (2008) argued that because transcribing is not just a straightforward and simple task, but involves judgment questions about the level of detail to include, the researcher should do the work.

In contrast to the process described earlier, some researchers believe that the analysis process involves identifying salient stories that either emerge from the data or are constructed as composites from bits and pieces of several data sources. For them, the meaning is in the story and in the researcher's interpretation of the story. This process works best if you have interview data from a number of individuals, although I have also used it with detailed and extensive interviews from one or two individuals. Those who adopt this stance take the position that coding raw data into concepts is a reductionistic practice and detracts from the meaning of what is said (see Chase, 2005, and Riessman, 2005, for additional details about the process).

■ How to Know When You Are Finished

Unlike statistical analysis, qualitative analysis has no defined end. You do not create statistical tables or statements about hypotheses. Rather, the process you follow seems to reach a logical saturation point. You collect your data and analyze your data at the same time. At some point, you complete collecting data. That point is often dictated by time or availability of people to interview or scenes to observe. I believe that you will know when you have sufficient data. Glaser (1978) referred to this as "theoretical saturation"; you find that you are not learning anything new. Well, your analysis follows the same idea. You read through your text. You code chunks, whether large or small. You reread your data. You change your codes. You combine your codes. You add codes. You delete codes. You combine your codes into categories. Your concepts come out of the categories. You reread your data. You look at new data. And so it goes.

Now, it is time to combine these codes into categories and then into concepts. You begin your sifting and sorting process anew, but you are working from the codes, not the raw data. You look to see whether the codes can be combined into categories. You try to winnow the number of codes down to a manageable number of categories. You restructure your codes into major categories and subcategories. Again, you work through a distillation from which concepts emerge from your categories.

Your final step is to select supporting evidence for the concepts you have developed. This evidence is often in the form of quotations from the raw data. Once done, you are ready to write.

■ Philosophical Stance

I agree with many writers who say that qualitative analysis is the least understood and most complex of all aspects of conducting qualitative research. I think it is important for you to clarify your views about the process of analysis, but first I want to reveal mine.

As the researcher, you are the best equipped to make sense of the data. Using others to verify your interpretations assumes that there are "right" concepts to find or that some "findings" are better than others. Get rid of that notion. Unlike statistical analysis, in qualitative research analysis, there is nothing that says that one set of interpretations is better than another. Now, that does not mean that you might not make a case for one set of interpretations over another based on your raw data, but "experts" are not needed here. You should be closer to your data than anyone else.

Using computer software makes the process easier; it does not give more reliable or believable results. The hard work of sifting, sorting, coding, organizing, and extracting remains yours.

The analysis is an integral part of the process of qualitative research. As such, it must begin early in your project. You should not wait until all your data are collected before you begin to think about your analysis. There are various procedures that you can choose to follow; whichever you choose, you need to document how you carried out your analysis.

It is important not to get to the end too quickly. The data need to be looked at several times. Don't jump to conclusions and concepts too quickly. That often leads to superficial analyses that don't really add much new information to the literature.

What about the role of theory? Although there is not agreement that theory building is part of qualitative research, some writers support the idea, especially when using grounded theory. And you should be aware of this. Wright (2007) described how she connects data analysis to theory building for her students studying public health. I like her suggestion of using a photograph of a coal-mining child to evoke issues of public health. The students were asked to write a story about the child from the photograph. That was their first attempt at coding. After practicing coding, they then practiced reducing the data. They then moved into theory building by looking at how creative and imaginative explorations can enhance systematized mechanical coding. I am particularly drawn to the visual display of data, which you can see in her interesting article.

■ Data Analysis With Computers

By now, you are probably asking yourself how you will manage all of this. I remember one student telling me that she made 3×5 cards with codes and hung them on the wall in her basement. She placed some codes under others, thereby creating categories with subcategories. She could move these around and regroup in order to organize them into concepts. Another way to organize into categories is to use markers or pencils of different colors and to sort like colors together. If you have a small amount of data, this works pretty well. But even with a small amount of data, you lose the links between the raw data you have coded, the codes and categories you have developed, and your concepts. And what happens if you have a large amount of data? This is where computer programs enter the arena.

As I said earlier, I expect that you will have entered your data into a word processing program. This is, of course, valid for data that are in words. At a basic level, you can use a word processing

program to find a given word or phrase in the text. For example, Microsoft Word has a "Find" feature that searches text and indicates each instance of a particular word or phrase. You could begin to code your raw data by asking the program to find a given phrase, then highlight it, and change the text color. Next, you could give each of those phrases the same code. You could do this for each set of raw data you have. Of course, you would have to keep track of the color and coding scheme that you have developed. There are several advantages to this simple process: (1) the ability to locate terms in text quickly, (2) the ability to identify text associated with the terms, and (3) the ease of storing and accessing information in comparison to the old way of color coding or sorting on the dining room table.

When I began teaching qualitative research, I was very reluctant to use computers. It seemed to me that by using computers I was buying into a paradigm that valued numbers, tables, and precision, yet I recognized that much of qualitative research took a different approach. What was I to do? I thought a qualitative software program might be too structured; in fact, I was not even sure what these programs did. We are a far cry from note cards and search-and-find features of basic word processing programs. There is now a fairly substantial number of sophisticated computer programs that permit a more elaborate system of coding, searching, and retrieval of information.

Known as qualitative data analysis software (QDAS) or as CAQDAS, a number of software programs have been developed. Four are thoroughly described in di Gregorio and Davidson's (2008) comprehensive text: ATLAS.ti, MAXqda, NVivo, and XSight.

QSR International has been one of the leaders in the field. You can read about their programs on the website (www.qsrinternational.com/). I am most familiar with the software this company offers. NVivo will allow you to perform a number of functions that I describe subsequently. I suspect other software products will allow you to perform similar functions. NVivo has additional functions not described below.

Importing files into a project. You can import any text material into the program directly from your word processing program. You can bring in one or many files at the same time. This saves an incredible amount of time. You can also link any other material that is nontextual through a process of external links. Thus, if you have photographs or audio material that you do not want to lose, you can make links directly to your master file. New material can easily be added. You can also bring in results of your literature review. Thus, all of your data—whether interview data, photographs, references, or notes—can be organized and placed in the same project. This is a tremendous advantage, even if the program does nothing else for you. The latest versions of NVivo have the capacity to handle videos and audio. It is also available in Chinese and Spanish.

Coding information in your project. You can begin coding the various files you have in your project. Some simple keystrokes will enable you to mark a word, line, sentence, or section and code for that piece of data with whatever term you want. The program makes a list of the various codes you have chosen. As your coding progresses, you might find that you have used terms that are similar. The program will let you combine several codes if you wish. New codes can always be added and others deleted. You can also code demographic information and develop tables and charts. If desired, the data can be exported into SPSS or a spreadsheet for display or analysis.

Organizing codes in your project. You can begin organizing the various codes you have developed into a series of nodes with branches. This is similar to putting codes into categories and subsets. In a way, this is how you begin to take your raw data, code them, and develop concepts. The program has enormous flexibility with these nodes.

Searching in your project. One of the great strengths of this program is that you can conduct complex searches once you have coded your data. There are more than a dozen types of searches that you can conduct. Once you decide what you want to do, the program will locate information from any of your files and bring it into a new file and provide ready access.

Building models. You can develop models representing your theoretical position, either prior to your analysis or subsequent to it. Attractive graphics facilitate this task.

Other capabilities. You can create a file for your personal memos or self-reflections and add these to your project at any time. You can manage an enormous amount of data in a single project. You can work on your project with others and share your ideas. QSR training has now reached the United States; the developers are readily available to answer your questions. The website is very accessible. Although based in Australia, they often are in England at workshops and presentations. QSR provides online support and runs a Listserv where most of your questions can be answered.

Limitations. As you can tell, I really like this program. But I will be the first to admit that it is very difficult to learn. I don't think you can learn it on your own, so you need to decide whether it is worth the effort. A student version is available at a reduced cost. If you get it and use it, I believe it will open up many ideas to you that you have not thought of before.

You can read about other computer software programs such as Ethnograph, AtlasTI, and so on. I write about QSR products to illustrate the best of what is out there. However, if you have a small amount of data and a small budget, go for the old-fashioned method. Make use of your computer word processing programs as best as you can.

Shulman (2011) has developed Texifter, mentioned in Chapter 6, a program that captures live data from social media such as Facebook or Twitter and enables basic coding of text. I participated in a webinar that demonstrated the ease with which the system works. One caveat is in order: At the present time (spring 2011) the coding is limited to basic two or three levels of response (e.g., positive, neutral, or negative).

At a 2010 conference comparing five software packages, Woods and Dempster (2011) described Transana (www.transana.org/), a qualitative analytic software that can examine multiple simultaneous video streams.

■ Other Issues

In what ways can cloud computing be affected by and affect qualitative research? While not technically a software program, cloud computing, introduced in Chapter 6, enables computational resources on demand by using a computer network. Such a paradigm enables users—whether or not they have a particular piece of software—to access the software on demand and pay accordingly. Since it exists in a virtual environment, it is basically in the clouds. Mei, Chan, and Tse (2008) have referred to this paradigm as a way to share data, calculations, and services transparently

among many users on a massive grid. Oza, Karppinen and Savola (2010) reported on a qualitative study of expert users from the Finnish Cloud Software Program Consortium.

How can Web 2.0 be useful in qualitative analysis? Also discussed in Chapter 6, Web 2.0 is associated initially with Darcy NiNucci who coined the term in 1999. O'Reilly media ran a Web 2.0 conference in 2004. Today it is associated with web applications that facilitate information sharing and collaboration on the web. It has been described as a revolutionary way to create, collaborate, edit, and share user-generated content online—what a great arena for qualitative researchers. Duffy (2008) described a number of qualitative research groups on Web 2.0 social networking sites. She sees their value as incubators for innovation. But I think Europe and the Far East are ahead of the United States on this topic. A conference on qualitative research in social media and Web 2.0 was held in Macau in 2011. The 4th European Conference on Computer-Aided Qualitative Research is scheduled for September 2011 in Switzerland. The latest technologies to be discussed are desktop software, mobile computing, and Web 2.0 platforms.

Secondary analysis of qualitative data is a fairly new idea. Heaton's thoughtful book on reworking qualitative data highlights some important issues (Lichtman, 2005). Corti (2007) has provided information about a project conducted in Finland dealing with archived qualitative data. Mruck (2005) commented on this and issues of data archiving and data protection in her editorial in a special issue of *FQS* on qualitative secondary data analysis.

A number of issues have surfaced recently regarding the use of the Internet and qualitative data. Can you use qualitative data that is found on the Internet for your study? Shulman recently posted in an e-mail that he had captured a large number of tweets related to Bin Laden. He made them available to his research community, but within a day he was asked not to do so. They have been removed from his site. How can you organize and process data you collect on the Internet? Are there available tools to facilitate this process?

A number of online journals make qualitative data available to the marketplace. How can you gain access? How useful is it? Is secondary analysis of qualitative data legitimate?

Should data be archived? What about the quality of the data? Who should have access? Who should maintain the files? The Faculty of Social Sciences Committee on Ethics (FSSCE, n.d.) at Lancaster University has published a paper on the legal aspects of archiving qualitative data that addresses such issues as who holds the copyright, the potentially sensitive nature of some of the data and the potential harm to participants, and the issues of anonymity and privacy (see also Bryman & Burgess, 1994).

■ Summary

Unlike quantitative research, qualitative research—with the exception of grounded theory—lacks prescriptive guides to data analysis, although several approaches are suggested: constant-comparative method, content analysis, discourse analysis, and qualitative comparative analysis. Most approaches are based on identifying concepts or telling stories. Regardless of which approach you use, you are a key tool in the analysis process, and you need to document your process.

The three Cs of data analysis are coding, categorizing, and concepts. I suggest a six-step process: (1) initial coding, (2) revisiting initial coding, (3) developing an initial list of categories or central ideas, (4) modifying your initial list based on additional rereading, (5) revisiting categories and subcategories, and (6) moving from categories to concepts.

For larger data sets, computer programs such as NVivo or other QDAS programs can increase efficiency.

GROUP ACTIVITY

Purpose: Move from coding to concept development.

Activity: Select a piece of writing from the Internet. You can use a blog, a newspaper article, or other current topic. Have each class member provide codes of the text. Form small groups to review the codes together and categorize the codes into concepts. Compare concepts from different small groups.

Evaluation: Explore the extent to which individuals are able to move from codes to concepts.

INDIVIDUAL ACTIVITY

Purpose: Practice narrative analysis.

Activity: Write a short paper using metaphors to describe an important event in your life. Share your paper with class members. Compare analysis using coding and concepts with analysis using narratives.

Evaluation: Determine in what ways class members are able to make meaning from each method of analysis.

STUDENT STUDY SITE

Log on to the Web-based student study site at www.sagepub.com/lichtman3e for additional study tools including:

- eFlashcards
- Web Resources

- Links to SAGE Journal Articles

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