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RESEARCH DESIGN AND DATA MANAGEMENT

CHAPTER SUMMARY

This chapter discusses how qualitative research design decisions influence and affect later data analysis. Such core topics include conceptual frameworks, methodologies, research questions, instrumentation, sampling, consideration of mixed methods, and data management with computers and software.

CONTENTS

INTRODUCTION

This book is about qualitative data analysis, but first we need to discuss how initial research design decisions may influence and affect the forthcoming analytic components of the study. Research design choices such as the conceptual framework, research methodology, research questions, data collection methods, participant sampling, and so on are analytic acts themselves. They are a sort of *anticipatory data condensation* because they rule out certain factors and relationships and attend to others. Even technical management tasks such as how data will be stored, organized, and processed, and what computer software may be used, both support and affect analysis.

We cannot deal thoroughly here with qualitative research design; see the appendix for recommended titles on the topic. In this chapter, we discuss the *analytic issues* that arise as a study is conceived and implemented. We provide specific examples but want to emphasize that these issues must be dealt with uniquely and flexibly in any particular study. Initial design decisions nearly always lead to a redesign.

LOOSE VERSUS TIGHT RESEARCH DESIGNS

Prior to fieldwork, how much shape and structure should a qualitative research design have? Some researchers keep prestructured designs to a minimum. They consider social processes too complex, too contextual, too elusive, or too fluid to be approached with explicit conceptual frameworks or standardized data collection instruments. They prefer a more loosely structured, emergent, inductively grounded approach for gathering data. Their conceptual frameworks will tend to emerge from the field during the course of the study. The important research questions will become clear only gradually; meaningful settings and participants will not be selected prior to fieldwork but only after initial orientation to the site.

Highly inductive, loosely designed studies make good sense when experienced researchers have plenty of time to explore unfamiliar cultures, understudied phenomena, or very complex social processes. But if you're new to qualitative research and are looking at a better understood phenomenon within a familiar culture or subculture, a loose, inductive design may be a waste of time. Months of fieldwork and voluminous data may yield only a few analytic banalities. Also, fieldwork may well involve multiple-case research rather than single-case studies. If different fieldworkers on a research team are operating inductively with no common framework or instrumentation, they are bound to end up with the double dilemma of data overload and lack of comparability across cases.

Tighter designs provide clarity and focus for beginning researchers worried about protocols and data overload. Tighter designs are also a wiser course for researchers working with well-delineated research questions or who wish to test or further explicate hypotheses. A standardized protocol for data collection across multiple sites gathered by multiple fieldworkers permits better cross-case comparison and analysis.

Yet in multiple-case research, the looser the initial framework, the more each researcher can be receptive to local idiosyncrasies—but cross-case comparability will be hard to get, and the costs and the information load for analysis will be colossal. Tightly coordinated designs face the opposite dilemma: They yield more economical, comparable, and potentially generalizable findings, but they are less case sensitive and may entail bending data out of contextual shape to answer a cross-case analytic question.

Then, too, we should not forget why we are out in the field in the first place: to describe and analyze a pattern of interrelationships. Starting with them (deductively) or getting gradually to them

(inductively) are both possible. In the life of a study, we need both approaches to pull a mass of facts and findings into a wide-ranging, coherent set of conclusions and generalizations.

A case can be made for tight, prestructured qualitative designs and for loose, emergent ones. Whether you choose one end of the continuum or the other for your particular study must be your decision. But a midway point between the extremes is yet another position, and perhaps the one most qualitative researchers take.

DISPLAYING THE CONCEPTUAL FRAMEWORK

Description and Rationale

A conceptual framework explains, graphically and/or in narrative form, the main things to be studied—for example, the key factors, variables, phenomena, concepts, participants—and the presumed interrelationships among them—as a *network*. Conceptual frameworks are simply the current and evolving version of the researcher's "map" of the qualitative territory being investigated. As the explorer's knowledge of the terrain improves, the map becomes correspondingly more differentiated and integrated. Thus, conceptual frameworks are developed at the beginning of a study and evolve as the study progresses. This framework also becomes a template, of sorts, for how data collection and analysis begin and proceed during and after fieldwork.

A conceptual framework forces you to be selective—to decide which things are most important; which relationships are likely to be most meaningful; and, as a consequence, what information should be collected and analyzed—at least at the outset. If multiple researchers are involved, the framework helps them study the same phenomena in ways that will permit an eventual cross-case analysis.

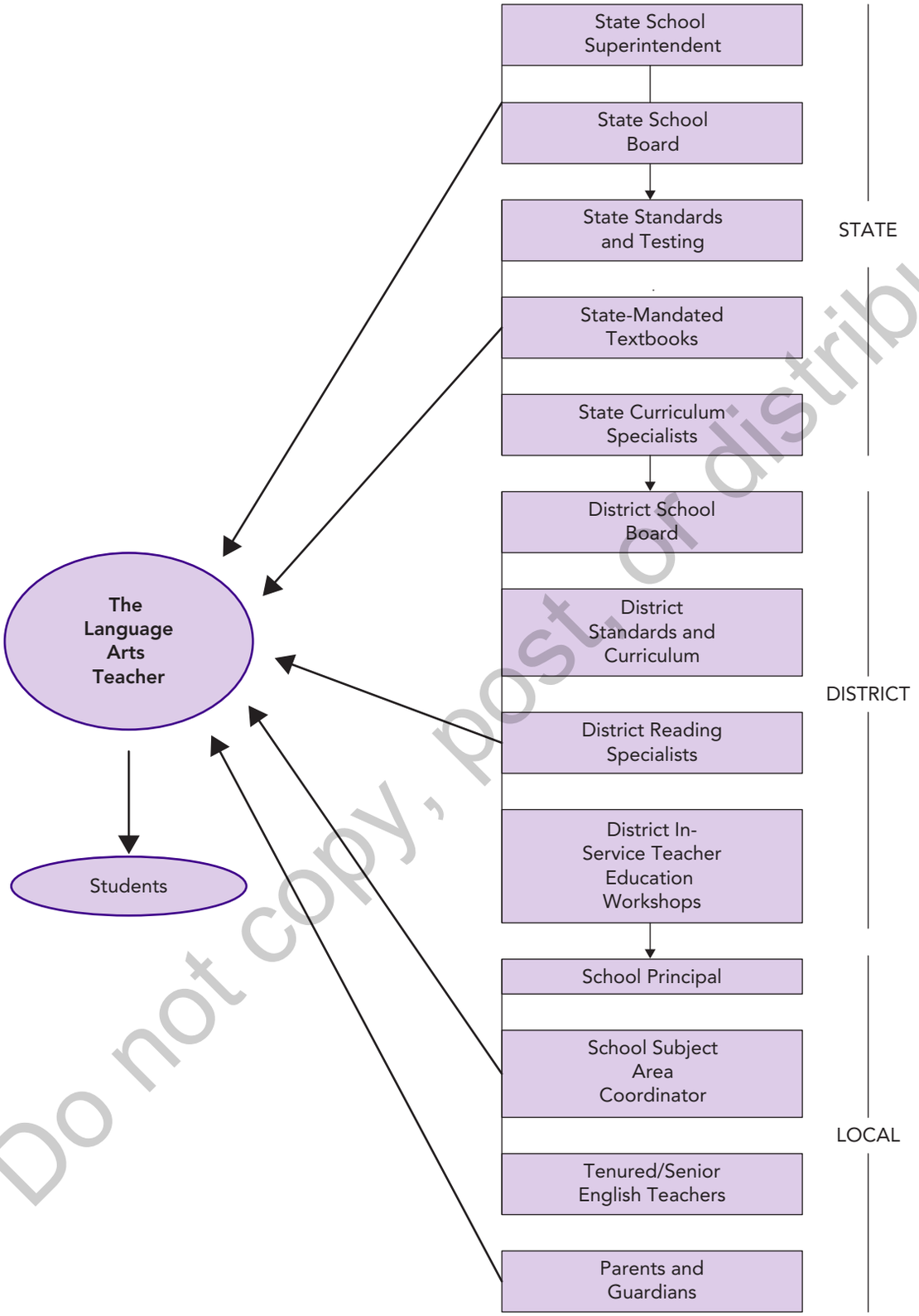
Conceptual frameworks can be simple or elaborate, descriptive or causal, commonsensical or theory driven. Theory relies on a few general concepts that subsume a mountain of particulars. *Culture*, *social intelligence*, *coping*, and *identity* are the labels we put on intellectual "bins" containing constituent actions, experiences, variables, categories, processes, and events. Bins come from theory, from personal experience, and often from the general objectives of the study envisioned. Setting out bins, naming them, and getting clearer about their interrelationships help lead you toward a conceptual framework. It is both the process and product of analytic reflection.

A note on terminology: Some use the terms *conceptual framework* and *theoretical framework* interchangeably, but some methodologists note that there are distinct differences between the two, depending on whose definitions you read. To us, a theoretical framework utilizes theory/theories and their constituent elements as the presumed "working model" that drives the investigation and analysis of a social phenomenon. But a conceptual framework is a more inductively derived and evolutionary model that can certainly include aspects of the theoretical, but primarily incorporates case- or site-specific variables, concepts, contexts, participants, and so on. In other words, a conceptual framework grounds itself in the local elements of a particular, unique study; a theoretical framework abstracts a study's ideas based on the literature.

Example

A conceptual framework can specify who and what will (and will not) be studied. Display 2.1 is a *first-cut*, *first-draft* attempt at listing, in graphic form, the myriad influences on a single classroom teacher. This illustration identifies the people (state school superintendent, district reading specialists, etc.); organizations (state school board, district school board, etc.); and "things" or

DISPLAY 2.1 ⬢ A First-Draft Conceptual Framework for a Case Study Teacher and the Influences on Her Practice



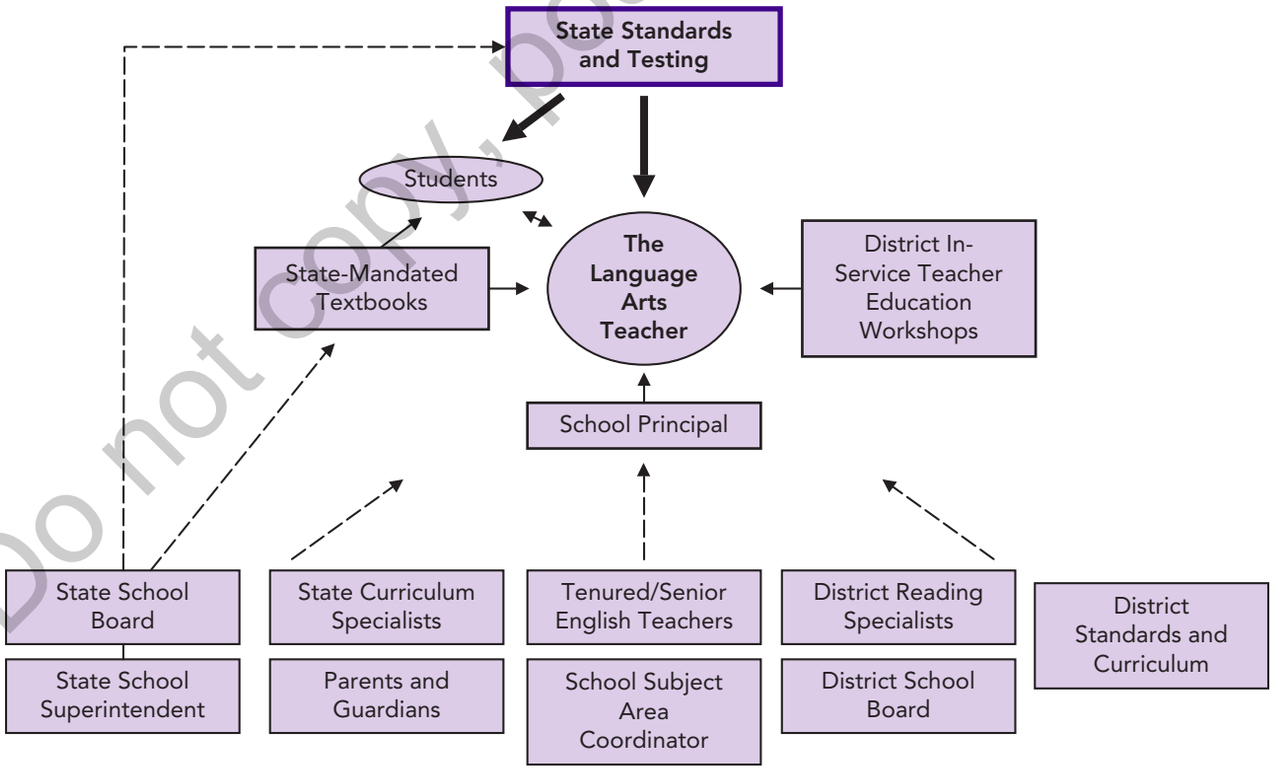
official documents/policies (state-mandated textbooks, district standards and curriculum, etc.) the researcher identified as influential on a classroom teacher's instructional practices with her students. There is a general clustering of *who*s and *what*s by level—state, district, and local—and an implied hierarchy of supervision/authority and distribution of power from top to bottom.

We see here the focusing function of a conceptual framework. Some, not all, social actors in this long list are going to be studied, along with some, not all, aspects of their activity. For example, the researcher, due to accessibility, may be unable to directly interview the state school superintendent or state school board members. But he can certainly access public documents and records of their official business from published minutes of state school board meetings. Once all permissions have been obtained, the language arts teacher herself will be interviewed several times and observed teaching in several of her classrooms. Documents such as her lesson plans, textbooks, and samples of graded student work will be reviewed. Only some relationships in this conceptual framework will be explored, certain kinds of processes documented, and certain analyses made—at least at the outset.

Now for a slightly more complex (i.e., "messy") conceptual framework using some of the same aspects of this study as they evolved. Display 2.2 includes the exact same bins and labels as Display 2.1, but their arrangement and the arrows of influence are different. There is less symmetry (support that the network reflects the "asymmetrical" social world we live in), a new hierarchy, and a different set of interrelationships.

The researcher got to this display after spending some time observing and interviewing the language arts teacher. State standards and testing were the primary factors that influenced both her practice

DISPLAY 2.2 ⬢ Major Influences on a Language Arts Teacher's Practice



and the students' classroom experiences. Of all the players from Display 2.1 that were hierarchically listed, some were actually quite peripheral *according to the perspective of the language arts teacher*. These are listed at the bottom of the display, with dashed arrows toward the major bins suggesting minimal or foregrounded influence.

The other three major factors the researcher learned and interpreted as most salient were the teacher's school principal and her "obsession" with raising the school's standardized test scores, the district in-service teacher education workshops (which the teacher praised and found "extremely useful for me and my kids"), and the state-mandated textbooks (which heavily emphasized writing over literature appreciation for language arts).

A display such as this might be considered partly *confirmatory* if the researcher is able to visit other language arts teachers within the same school and within other schools outside the district to determine if their spheres of influence also include the same factors. A *working hypothesis* for field testing that the researcher developed after studying and analyzing this display is this: *The mandates of education manifest themselves primarily as prescriptive products imposed on educators and their students.* Overall, what Displays 2.1 and 2.2 illustrate is that conceptual frameworks *evolve* as a study continues and the bigger picture becomes clearer. Display 2.2 is the product of fieldwork, initial data analysis, and a processual model for testing as additional data and analysis continue.

The conceptual framework is your first analytic *display*. It is a visual representation of your main conceptual ideas about a study and how they interact and interplay with each other. Also remember that conceptual frameworks tell a *story* of some kind. They are evolving, one-page representations of your research in progress, comparable to the storyboards of filmmakers, who first draw on paper or render with software what they will eventually document on digital video.

Other Examples

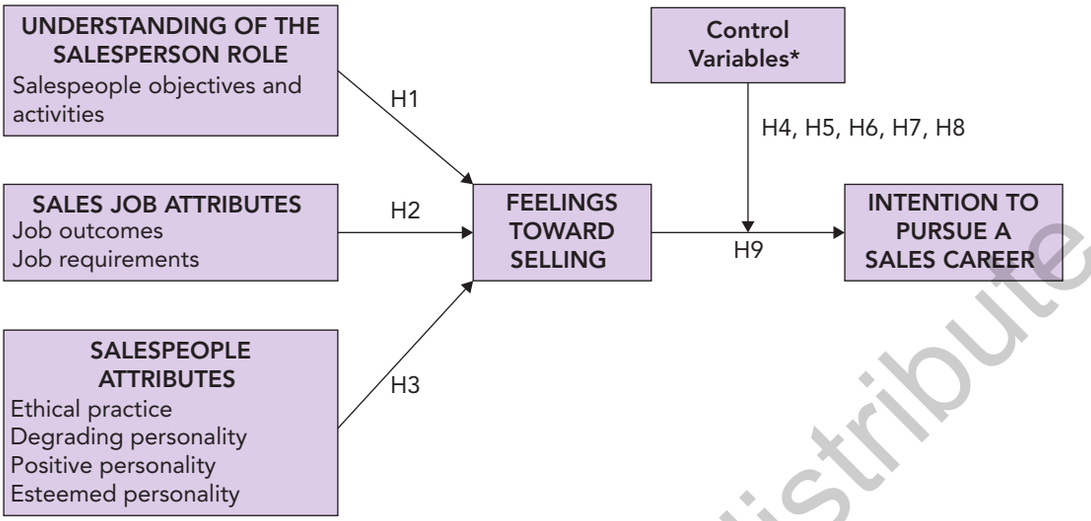
We now provide two examples from published studies that illustrate the display possibilities for conceptual frameworks. Space does not permit us to discuss each one in depth, but we hope you can get the gist of the researchers' approaches by examining the bins and their proposed interaction patterns and trajectories.

Display 2.3, from Ballestra, Cardinali, Palanga, and Pacelli (2017), portrays a conceptual model of teenage students' intentions to pursue a sales career. Notice that the overall design follows a linear trajectory. But also notice that each arrow has one or more hypotheses (H1, H2, H3, etc.) attached to it. Hypothesis 1 in this study is as follows: "Understanding the changes to the salesperson's role will have a significant impact on students' feelings toward selling as a career" (p. 178). Hypothesis 8 is the following: "Studying business/economic subjects during high school has a significant impact on students' later intent to pursue a sales career" (p. 179). This conceptual framework includes nine specific hypotheses, developed from the coresearchers' literature review, to test as qualitative and quantitative data are collected and analyzed. Not only is their display a preliminary or *exploratory* model of a young adult's sales career process, it is also an analytic game plan to examine whether their participants' experiences support the theories of the field.

Display 2.4, from Chapman et al. (2017), examines the role of powerlessness among health care workers in tuberculosis infection control. This model, however, is not representative of the beginning of the study but rather the *end* of it, after the data have been collected and analyzed:

> The first cycle describes the context of powerlessness, while the second cycle represents how empowerment through evidence-based interventions can be applied in the future.

DISPLAY 2.3 ⬢ A Conceptual Model of Students' Intention to Pursue a Sales Career

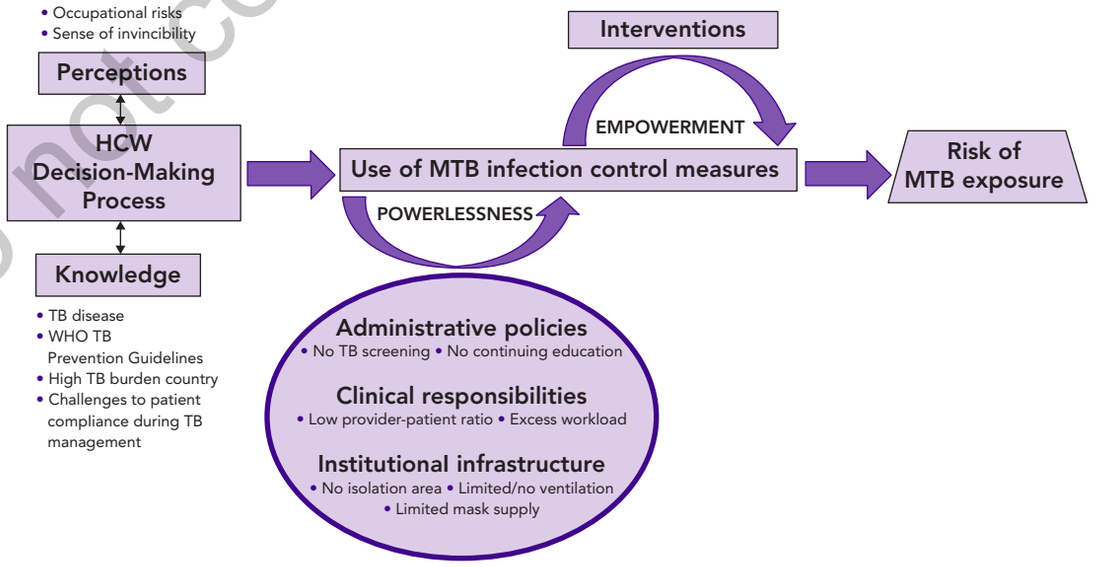


Source: Ballestra, Cardinali, Palanga, & Pacelli (2017), p. 181.

> [Display 2.4] presents the HCWs' [Health Care Workers'] perceived limitations in the application of *M. tuberculosis* infection control measures in clinical practice, influencing the decision-making process and resulting in the knowledge-action gap. (Chapman et al., 2017, p. 2119)

Like Display 2.3, this too is a linear model, but notice how the bins in Display 2.4 are supported with bullet-pointed factors that detail the analytic findings. This conceptual model elegantly maps the researchers' conclusions in story form with an accompanying narrative that explains the participants' dilemmas and experiences.

DISPLAY 2.4 ⬢ Conceptual Model That Presents HCWs' Perceived Limitations in the Application of MTB Infection Control Measures in Clinical Practice, Influencing the Decision–Making Process and Resulting in the "Knowledge–Action" Gap



Source: Chapman et al. (2017), p. 2120.

Conceptual Framework Advice

Here are some suggestions that summarize and extend what has been reviewed in this section:

1. Conceptual frameworks are best done graphically, at first, to support the accompanying narrative. Having to get the entire framework on a single page obliges you to specify the bins that hold discrete phenomena, map likely interrelationships, divide variables that are conceptually or functionally distinct, and work with all of the information at once.
2. Expect to do several versions right from the outset. There are probably as many ways of representing the main variables as there are variables to represent, but some—typically later cuts—are more elegant than others.
3. If your study has more than one researcher, have each field researcher do a cut at a framework early on and then compare the several versions. This procedure will show, literally, where everyone's head is. It usually leads to an explication of contentious or foggy areas that otherwise would have surfaced later on.
4. Avoid the no-risk framework—that is, one that defines variables at a very global level and has two-directional arrows everywhere. This avoidance amounts essentially to making no focusing decisions and is little better than the strategy of going indiscriminately into the field to see what the site has to tell. However, you can begin with a generic framework as a way of getting to a more selective and specific one.
5. Prior theorizing and empirical research are, of course, important inputs. It helps to lay out your own orienting frame and then map onto it the variables and relationships from the literature available, to see where the overlaps, contradictions, qualifications, and refinements are.

For an extended discussion of conceptual frameworks and how they influence and affect all aspects of research, see Ravitch and Riggan (2016).

METHODOLOGIES (GENRES) OF QUALITATIVE RESEARCH

Qualitative research can be conducted in dozens of ways, many approaches with long traditions behind them. Saldaña (2011b) describes more than 20 different qualitative research genres (i.e., methodologies or types) out of many more available to investigators, ranging from well-established traditions such as ethnography, grounded theory, phenomenology, case study, and content analysis, to more progressive genres of qualitative research such as poetic inquiry, narrative inquiry, ethnodrama, and autoethnography. To do them all justice is impossible here. For our purposes, the questions are as follows: What do selected genres of qualitative research have to say about *analysis*? And can we see some common themes and practices among them?

Ideally, the conceptual framework you develop for a study is the impetus for selecting the most appropriate methodological approach to investigate its major components. For example, if you conceptualize that depression is a cognitive and emotional *experience*, then a *phenomenological study* with its emphasis on *thematic analysis* may be an appropriate choice. If you conceptualize that depression is an intimate, personal, and contextual state of being, then perhaps an exemplary *case study* of an individual living with depression, holistically analyzed through *narrative vignettes*, may be in order.

Yet sometimes the methodology we select is based not on our conceptual framework but rather on our *research questions* of interest (discussed next). If we wish to get the best answers to our particular set of inquiries, then we should select the best research genre *and its accompanying methods* that will produce them. If we wish to know the details of *how* people cope with depression in their daily lives, then a series of *interviews* with participants may be more revealing than participant observation of their day-to-day routines. Interview transcripts would then be carefully *coded* to develop major *categories* of coping with mental illness (e.g., psychotropic medication, professional therapy, self-care strategies).

Some researchers, however, have a particular affinity for just one genre of research and dedicate their professional careers to studying social life through a particular framework. They may label themselves "grounded theorists," "phenomenologists," or "autoethnographers," and thus investigate the world through a specialized methodological lens and design their projects to accommodate their preferred ways of working. Over time, they also develop nuanced expertise in the genre itself and have much to offer other researchers about a particular methodology and its methods.

The point of this discussion is that the particular research methodology you select for your study will determine what types of data collection methods you employ and thus what types of analysis might be undertaken. Grounded theory, for example, uses a series of cumulative coding cycles and reflective analytic memoing to develop a core category for theory generation. Phenomenology tends to look at data thematically to extract essences and essentials of participant meanings. Mixed methods research integrates both qualitative and quantitative data and analyses for a more multidimensional approach to inquiry. Poetic inquiry, narrative inquiry, and ethnodrama adopt and adapt the conventions of fictional literature to render nonfictional participant experiences in poetic, prosaic, and dramatic forms, as opposed to the traditional and conventional formats of scholarly/academic writing.

The purpose of this section is not to describe every single methodology of qualitative research available to you but to focus on some common features that occur in most genres of qualitative inquiry. We list some of them here, aware that some exemplars are missing:

1. Qualitative research is conducted through intense and/or prolonged contact with participants in a naturalistic setting to investigate the everyday and/or exceptional lives of individuals, groups, organizations, cultures, and/or societies.
2. The researcher's role is to gain a holistic (systemic, encompassing, and integrated) overview of the context under study: its social arrangement, its ways of working, and its explicit and implicit rules.
3. The researcher attempts to capture data on the perceptions of local participants from the inside through a process of deep attentiveness, empathetic understanding, and suspension or bracketing of preconceptions about the topics under discussion.
4. Relatively little standardized instrumentation is used, though audio-recorded interviews with participants tend to be used most often. The researcher himself or herself is essentially the main instrument in the study.
5. Most of the analysis is done with words. The words can be assembled, subclustered, or broken into segments. They can be reorganized to permit the researcher to compare, contrast, analyze, and construct patterns out of them for analytic outcomes such as extended narratives, categories, themes, assertions, propositions, and/or theories.
6. The main task is to describe and explain the ways people in particular settings come to understand, account for, take action, and otherwise manage their day-to-day situations.

These features may be more relevant for naturalistic, ethnographic studies, but they are configured and used with slight variation in many social research traditions.

FORMULATING RESEARCH QUESTIONS

Description and Rationale

Research questions represent the facets of inquiry that the researcher most wants to explore. Research questions may be general or particular, descriptive or explanatory. The formulation of research questions may precede, follow, or happen concurrently with the development of a conceptual framework and/or the chosen methodological approach. They also may be formulated at the outset or later on and may be revised or reformulated during the course of fieldwork.

It is a direct step from a conceptual framework to research questions. If I have a bin labeled "State-Mandated Textbooks," as in Display 2.1, with an arrow from that bin directed toward "The Language Arts Teacher," I am implicitly asking myself some questions about how textbooks influence a teacher's practice (e.g., *In what ways do state-mandated language arts textbooks shape the language arts teacher's curriculum?*). If I have a two-way arrow between "The Language Arts Teacher" and "Students," as in Display 2.2, my question has to do with the reciprocal interrelationship between them and the interpersonal dynamics of education (e.g., *What kinds of teaching-learning methods best prepare students for state-mandated testing in language arts?*).

If my conceptual framework is more constrained, so are my questions. In Display 2.2, the State School Board has little, if any, direct *influence and affect* (our qualitative preference over quantitative research's "cause and effect") on the teacher—even though it was the body that mandated state standards and testing. To the teacher, the *tests* are perceived as the primary influence on her practice, not the personnel or administrative overview of the State School Board. There may be one research question about the board to verify its inconsequential impact, but not much time or effort will be spent in pursuing this minimal factor.

What do these questions do for me? They tell me what I want to know most or first; my collection of data will be more focused. I am also beginning to make some implicit sampling decisions. I will look only at *some* participants in *some* contexts dealing with *some* issues. The questions also begin to point me toward data-gathering methods—observations, interviews, and document collection. Finally, the research questions begin to operationalize the conceptual framework and make the initial theoretical assumptions even more explicit.

A conceptual framework's display shows researchers' preferred bins and relational arrows as they map and carve up social phenomena. They use these explicitly or implicitly to decide which questions are most important and how they should get the answers. We believe that better research happens when you make your framework (and associated choices of research questions, cases, sampling, instrumentation, etc.) explicit, rather than claiming inductive purity.

Example

Our (Miles and Huberman's) school improvement study investigated the dissemination of educational innovations carried out from 1979 to 1983. (Many display examples in this text come from that classic study. More detailed information appears in the first, second, and third editions of this book.) The study was nested in a larger study of school improvement, covering 145 school buildings and nearly 4,000 people throughout the United States involved in the implementation of educational innovations. Joined by two colleagues, Beverly Loy Taylor and Jo Anne Goldberg, we

repeatedly visited a stratified sample of 12 field sites across the country throughout the 1979–1980 school year, with follow-up contacts the next year to verify the main findings.

The volume of data collected included 440 interviews, 85 observations, some 259 documents, and 2,713 pages of field notes. We developed a common set of data displays and, for each of the 12 field sites, used them to draw conclusions, resulting in 12 case reports ranging from 70 to 140 pages each, with a common format. Our subsequent cross-case analysis was built from the appropriate sections of the 12 case reports.

A study of this scope necessitated an extensive series of research questions, and we present just one subset of them related to a school's decision to adopt an educational innovation. The procedure we used was to cluster specific research questions under more general ones, as shown in Display 2.5.

DISPLAY 2.5 ⬢ General and Special Research Questions Relating to the Adoption Decision (School Improvement Study)

How was the adoption decision made?

- Who was involved (e.g., principal, users, central office people, school board, outside agencies)?
- How was the decision made (top-down, persuasive, consultative, collegial-participative, or delegated styles)?

How much priority and centrality did the new program have at the time of the adoption decision?

- How much support and commitment was there from administrators?
- How important was it for teachers, seen in relation to their routine, "ordinary" activities, and any other innovations that were being contemplated or attempted?
- Realistically, how large did it loom in the scheme of things?
- Was it a one-time event or one of a series?

What were the components of the original plan for implementation?

- These might have included front-end training, monitoring and debugging/troubleshooting unexpected problems, and ongoing support.
- How precise and elaborate was this plan?
- Were people satisfied with it at the time?
- Did it deal with all of the problems anticipated?

Were the requisite conditions for implementation ensured before it began?

- These might have included commitment, understanding, materials and equipment, skills, time allocation, and organizational backup.
- Were any important conditions seen as missing? Which were most missing?

Source: Miles, M. B., & Huberman, A. M. (1994). *Qualitative data analysis: An expanded sourcebook* (2nd ed.). Thousand Oaks, CA: Sage Publications.

Notice the choices being made within each topic area. For example, in the first two areas, the main things we want to know about the decision to adopt are who was involved, how the decision was actually made, and how important this project was relative to others. All of the questions seem to be functional, rather than theoretical or descriptive—they have to do with getting something done. When such a research question gets operationalized, an attempt will be made to determine whether these conditions were present or absent at the various field sites and whether that made any

difference in the execution of the project. This is an example of how research questions feed directly into data collection and thus analysis.

Research Question Advice

1. Even if you are in a highly inductive mode, it is a good idea to start with some general research questions. They allow you to get clear about what, in the general domain, is of most interest. They make the implicit explicit, without necessarily freezing or limiting your vision.
2. Formulating more than a dozen or so overarching research questions is looking for trouble. You can easily lose the forest for the trees and fragment the collection of data. Having a large number of questions makes it harder to see emergent links across different parts of the database and to integrate findings. A solution to research question proliferation for a small-scale study is the use of one major question with no more than five related subquestions for clarity and specificity. Studies with larger magnitude (e.g., multiple-case or longitudinal) can generate more research questions.
3. It is sometimes easier to develop a conceptual framework *after* you've made a list of research questions. You look at the list for common themes, common concepts, implicit or explicit relationships, and so on, and then begin to map out the underlying framework joining these pieces. Some researchers operate best in this mode.
4. Once the list of research questions is generated and honed, look it over to ensure that each question is, in fact, researchable. Delete or revise those questions that you or your participants have no real means of answering, or you of measuring (qualitatively or quantitatively).
5. In a multiple-case study, be sure all fieldworkers understand each question and see its importance. Multiple-case studies have to be more explicit, so that several researchers can be aligned as they collect information in the field. Unclear questions or different understandings can make for incomparable data across cases.
6. Keep the research questions in hand and review them during fieldwork. This closeness will focus data collection and analysis. You will think twice before noting down what participants have for lunch or where they park their cars. Unless something has an obvious, direct, or potentially important link to a research question, it should not be entered into your field notes.

DEFINING THE CASE

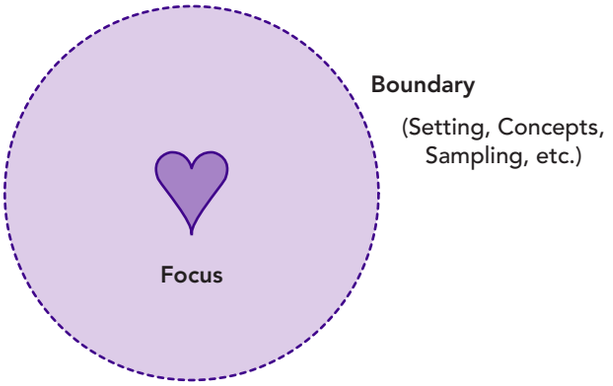
Description and Rationale

Qualitative researchers often struggle with questions of "what my case is" and "where my case leaves off." Abstractly, we can define a *case* as a phenomenon of some sort occurring in a bounded context. The case is, in effect, your unit of analysis. Studies may be of just one case or of several. Display 2.6 shows this graphically: There is a focus or "heart" of the study, and a somewhat indeterminate boundary defines the edge of the case: what will not be studied.

Examples

What are some examples of cases? Sometimes the "phenomenon" may be an *individual* in a defined context, as suggested by Displays 2.1 and 2.2: a language arts teacher and her series of classes with junior-level high school students during an 18-week spring semester—the same semester her students will take a state-mandated standardized "high-stakes" test in language arts. Note that the

DISPLAY 2.6 ⬢ The Case as the Unit of Analysis



Source: Miles, M. B., & Huberman, A. M. (1994). *Qualitative data analysis: An expanded sourcebook* (2nd ed.). Thousand Oaks, CA: Sage Publications.

"heart" here is the teacher. The boundary defines her students and school site as the major contexts. The researcher will not, for example, interview the teacher's mother or visit the child care facility where the teacher leaves her own child during workdays.

The bounding is also by *time*: No information will be gathered after the spring semester ends in 18 weeks and the standardized test scores have been reported. We can also expect that the boundary will be defined further by *sampling*, which we'll discuss later. For example, this researcher will not be interviewing the school guidance counselor, only the principal and, if pertinent, other language arts teachers.

A case may also be defined by

1. a *role* (school principal, CEO, nurse supervisor);
2. a *small group* (African American men in an inner-city neighborhood, a college-level rock band, a breast cancer survivor support group);
3. an *organization* (a nursery school, a software engineering company, the American Sociological Association);
4. *space and environment* (a mall for adolescents to "hang out," visitors at the Vietnam Veterans Memorial Mall in Washington DC, nighttime foot traffic along the Las Vegas strip);
5. a *community or settlement* (the French Quarter of New Orleans, a village in Tanzania, the Tenderloin District of San Francisco);
6. *episodes or encounters* (voting for the first time, a "one-night stand," bullying incidents on an elementary school playground);
7. an *event* (a search committee meeting, a high school graduation ceremony, New Year's Eve in New York City's Times Square);
8. a *period of time* (a day in the life of a firefighter, spring break, how customers use their time between ordering food from a server and having it delivered to their table);
9. a *process* (grocery shopping and meal preparation, organizing and managing an international conference, the adoption and implementation of an innovational education program in a school district);

10. a *culture or subculture* (African American women in academia, Los Angeles drag queens, "skater dudes"); or
11. a *nation* (Greece during the period of its 21st-century economic crisis, America during the 2018 midterm election cycle).

Single cases are the stuff of much qualitative research and can be very vivid and illuminating, especially if they are chosen to be "critical," "extreme," or "revelatory," as Yin (2018, p. 24) suggests. But the cases may not be monolithic; cases may have subcases embedded within them. A case study of a school will contain cases of specific classrooms; a case study of a hospital ward may have cases of specific medical personnel–patient relationships within it.

We suggest that multiple cases offer the researcher an even deeper understanding of the processes and outcomes of cases, the chance to test (not just develop) hypotheses, and a good picture of locally grounded causation. The question of just which cases to include in a sample is discussed below.

A comment on notation: We sometimes prefer—and use here and there in this book—the word *site* because it reminds us that a "case" always occurs in a specified social and physical *setting*; we cannot study individual cases devoid of their site-specific context in the way a quantitative researcher often does.

Case Advice

1. Define the case as early as you can during a study. Given a starting conceptual framework and research questions, it pays to get a bit stern about who and what you are defining as a case; that will help clarify further both the framework and the questions.
2. Start intuitively but remember the focus and build outward. Think of whom and what you will *not* be studying as a way to firm up the boundaries.
3. Attend to several dimensions of the case: its *conceptual* nature, its *social size*, its *physical* location, and its *temporal* extent.
4. Remember that sampling will define the case(s) further.

SAMPLING: BOUNDING THE COLLECTION OF DATA

Description and Rationale

Sampling involves decisions not only about which people to observe and/or interview but also about settings, events, and social processes. Qualitative studies call for continual refocusing and redrawing of study parameters during fieldwork, but some initial selection still is required. A conceptual framework and research questions can help set the foci and boundaries for sampling decisions.

Sampling may look easy, but settings have subsettings (schools have classrooms, classrooms have cliques, cliques have individuals), so deciding where to look is not easy. Within any case, social phenomena proliferate (science lessons, teachers' questioning techniques, student unruliness, use of innovations); they, too, must be sampled. But as much as you might want to, you cannot study everyone everywhere doing everything. Your choices—whom to look at or talk with, where, when, about what, and why—place limits on the conclusions you can draw and on how confident you and others feel about them. Sampling is crucial for later analysis, so how do we manage it all? We discuss some general principles and suggest useful references for detailed help.

Key Features of Qualitative Sampling

Qualitative researchers usually work with small samples of people, nested in their context and studied in-depth—unlike quantitative researchers, who aim for larger numbers of context-stripped cases and seek statistical significance.

Sampling in qualitative research involves two actions that sometimes pull in different directions. First, you need to set *boundaries*: to define aspects of your case(s) that you can study within the limits of your time and budget, that connect directly to your research questions, and that probably will include examples of what you want to study. Second, at the same time, you need to create a conceptual *frame* to help you uncover, confirm, or qualify the basic processes or concepts that undergird your study. Display 2.2 suggests that the frame of this study is primarily about the pressures and consequences of state-mandated testing on one language arts teacher and her students.

Qualitative samples tend to be *purposive* rather than random. Samples in qualitative studies are usually not wholly prespecified but can evolve once fieldwork begins. The initial choices of participants lead you to similar and different ones, observing one class of events invites comparison with another, and understanding one key relationship in the setting reveals facets to be studied in others. This is conceptually driven *sequential* sampling.

Qualitative sampling is sometimes *theory driven*, either "up front" or progressively, as in a grounded theory mode. Suppose that you were studying how adolescents develop friendships and that you could only manage to look at one high school. At first, that seems very limited. But if you chose a site according to relevant theory, you might choose one that has a wide range and diversity of students in terms of gender, race/ethnicity, socioeconomic class, sexual orientation, religious background, and so on. This will enable you to test the theory that friendships become more selective—that is, discriminating—when multiple choices are available to adolescents.

You would sample *within* each class (freshman, sophomore, junior, senior) for certain developmentally expected processes such as clique formation, orientation of the newcomer, use of technology for friendship maintenance, and so on. You might also find that certain events, such as lunchtime and organized extracurricular sports and arts activities, are unusually rich with socialization actions, and then you would sample more carefully for these. Sampling both within and across cases puts flesh on the bones of general concepts and their relationships. We can see generic processes; our generalizations are not to "all adolescents" but to existing or new theories of how friendship development works.

General Sampling Strategies

Erickson (1986) suggests a generic, funneling sampling sequence, working from the outside in to the core of a setting. For example, in studying schools, he would begin with the school community (census data, a walk around the neighborhood) and then enter the school and the classroom, staying several days to get a sense of the frequency and occurrence of different events. From there, the focus would tighten: specific events, times, and locations. Periodically, however, Erickson would follow lines of influence into the surrounding environment to test the typicality of what was found in a given classroom and to get a better fix on external influences and determinants.

There is a wide range of sampling strategies available to qualitative researchers within a complex case or across cases (Patton, 2008, 2015). They can be selected ahead of time or can evolve during early data collection. It is impossible to prescribe which sampling strategies go best with each type of study, for there are too many unique conditions within each project (specific research questions, specific sites and cases, etc.). But you should be able to provide to your readers justification for why you selected certain types of sampling over others.

Random sampling is a gold standard of quantitative research but is used quite minimally in qualitative research because random sampling can sometimes deal you a nebulous hand. Our sampling tends to be more *strategic* and *purposive* because we are focusing on a case's unique contexts. Admittedly, there are times when we select a case to study because it is accessible to us geographically and immediately—a form of *convenience* sampling.

How do sampling strategies affect analysis? *Maximum variation sampling*, for example, involves looking for outlier cases to see whether the main patterns still hold, while *homogeneous sampling* focuses on people with similar demographic or social characteristics. The *critical case* is the instance that supports or exemplifies the main findings. Searching deliberately for *confirming and disconfirming cases*, *extreme or deviant cases*, and *typical cases* serves to increase confidence in analytic conclusions. Some strategies benefit inductive, theory-building analysis (e.g., *opportunistic* or *snowball sampling*). *Politically important cases* are salient participants who may need to be included (or excluded) because they connect with politically sensitive issues anticipated in the analysis.

Other strategies can be used for selection of participants prior to data collection. For example, Goetz and LeCompte (1984) offer (a) *comprehensive sampling*—examining every case, instance, or element in a given population; (b) *quota selection*—identifying the major subgroups and then taking an arbitrary number from each; (c) *reputational case selection*—instances chosen on the recommendation of an expert or key participant; and (d) *comparable case selection*—selecting individuals, sites, and groups on the same relevant characteristics over time (a replication strategy). Most of these strategies will increase confidence in analytic findings on the grounds of representativeness.

The sampling strategies we've been discussing can be applied both within and across multiple cases. Let's turn to some of the core issues in each of these domains.

Within-Case Sampling

A qualitative case may range widely in definition from individuals to roles, groups, organizations, processes, and cultures. But even when the case is an individual, the qualitative researcher has many within-case sampling decisions: Which *activities*, *processes*, *events*, *times*, *locations*, and *role partners* will I sample?

Within-case sampling is almost always *nested*—for example, studying children within classrooms within schools within neighborhoods, with regular movement up and down that ladder. For a cardiovascular bypass patient, we might want to sample his or her diet and exercise activities; the processes of understanding, taking in, and acting on medical advice; events such as admission and discharge interviews; time periods, including prehospitalization, hospitalization, and posthospitalization (once every 2 weeks); locations, including the recovery room, the ward, and the patient's home; and role partners, including the patient's physician, ward nurses, dietitian, and spouse.

A second major point is that such sampling should be *theoretically* driven—whether the theory is prespecified or emerges as you go, as in traditional grounded theory's "theoretical sampling." Choices of participants, episodes, and interactions should be driven by a conceptual question, not by a concern for representativeness. To get to the concept, such as *negotiation*, we need to see different instances of it at different moments in different places with different people. The prime concern is with the *conditions* under which the concept or theory operates, not with the generalization of the findings to other populations.

The third point is that within-case sampling has an *iterative* or "rolling" quality, working in progressive waves as the study progresses. Sampling is investigative; we observe, talk to people, and examine artifacts and documents. That leads us to new samples of participants and observations,

new documents. At each step along the evidential trail, we are making sampling decisions to clarify the main patterns, see contrasts, identify exceptions or discrepant instances, and uncover negative instances—where the pattern does not hold. Our analytic conclusions depend deeply on the within-case sampling choices we made.

So, within-case sampling helps us see a local configuration in some depth. What can additional cases do for us, and how do we create a sample of cases?

Multiple-Case Sampling

Multiple-case sampling adds *confidence* to findings. By looking at a range of similar and contrasting cases, we can understand a single-case finding, grounding it by specifying *how* and *where* and, if possible, *why* it carries on as it does. We can strengthen the precision, validity, stability, and trustworthiness of the findings. In other words, we are following a *replication* strategy (Yin, 2018). If a finding holds in one setting and, given its profile, also holds in a comparable setting but does not in a contrasting case, the finding is more robust.

With multiple-case studies, does the issue of *generalizability* change? Essentially, no. We are generalizing from one case to the next on the basis of a match to the underlying theory, not to a larger universe. The choice of cases usually is made on *conceptual* grounds, not on representative grounds. The cases often are arrayed on a continuum (e.g., highly gifted to underachieving pupils), with few exemplars of each, or they are contrasted (e.g., assertive and passive adolescents). Other, unique properties may be added (e.g., some assertive adolescents are from cities, some from rural areas). Because case study researchers examine intact settings in such minute detail, they know all too well that each setting has a few properties it shares with *many* others, some properties it shares with *some* others, and some properties it shares with *no* others. Nevertheless, multiple-case sampling gives us confidence that our emerging theory is transferable, because we have seen it work out—or not work out—in predictable ways across different cases.

How many cases should a multiple-case study have? This question is not answerable on statistical grounds, of course. We have to deal with the issue conceptually: How many cases, and in what kind of sampling frame, would give us confidence in our analytic generalizations? It also depends on how rich and complex the within-case sampling is. With high complexity, a study with more than 10 cases or so can become unwieldy. There are too many data to scan visually and too many permutations to account for. And the problems of practical and intellectual coordination among multiple researchers get very large once you are a staff of more than five people. Still, we've seen multiple-case studies in the 20s and 30s; the price is usually thinner data. If we were forced to recommend a specific number, we would suggest five or six richly researched cases as a minimum for multiple-case sampling adequacy. (We have read outstanding qualitative studies that compared just two, three, and four cases, but their authors did not assert any generalizability.)

Questions of practicality also face us. There is a finite amount of time, with variable access to different participants and events, and an abundance of logistical problems. Being selective calls for some restraint in the classes of data you go after. Here we might suggest some guidelines. For example, useful data would (a) identify *new leads* of importance, (b) *extend* the area of information, (c) *relate* or bridge the already existing elements, (d) reinforce the main *trends*, (e) account for *other information* already in hand, (f) exemplify or provide more evidence for an *important theme*, and (g) *qualify or refute* existing information.

Key processes can be identified at the outset or gradually—often via pattern codes, analytic memos, and interim summaries (to be described in later chapters). Being explicit about processes and

collecting comparable data on them will foster cross-case comparability and give you easier access to the core underlying concepts as you get deeper into data collection.

Sampling Advice

1. If you're new to qualitative research, rest assured that there is never enough time to do any study. It is probably a good idea to start with a fallback sample of participants and subsettings: the things you have to cover in light of what you know at that point. That sample will change later, but less than you may think.
2. Just thinking in sampling-frame terms is good for your study's health. If you are talking with one kind of participant, you need to consider why this kind of participant is important and, from there, who else should be interviewed or observed.
3. In complex cases, remember that you are sampling people to get at the characteristics of settings, events, and processes. This means watching out for an overreliance on talk or on observation of participants while neglecting sampling for key events, interactions in different settings, and episodes embodying the emerging patterns in the study. The sampling choices at the start of the study may not be the most pertinent or data-rich ones. A systematic review can sharpen the early and later choices.
4. There is a danger of sampling too narrowly. Go to the meatiest, most study-relevant sources. But it is also important to work a bit at the peripheries—to talk to people who are not central to the phenomenon but are neighbors to it, to people no longer actively involved, to dissidents, renegades, and eccentrics. Spending a day in the adjoining village, school, neighborhood, or clinic is also worth the time, even if you don't see the sense at that point. You may learn a lot and obtain contrasting and comparative information that may help you understand the phenomenon at hand by decentering yourself from a particular way of viewing your primary cases.
5. Spend some time checking whether your sampling frame is feasible. Be sure the time is there, the resources are there, the requisite access to people and places is ensured, and the conditions are right for doing a careful job. Plan to study a bit less, rather than more, and "bank" the extra time. If you are done, the time is yours for a wider or deeper pass at the field.
6. Three kinds of instances have great payoff. The first is the apparently "typical" or "representative" instance. If you can find it, try to find another one. The second is the "negative" or "disconfirming" instance; it gives you both the limits of your conclusions and the point of greatest variation. The third is the "exceptional" or "discrepant" instance. This instance will allow you to qualify your findings and to specify the variations or contingencies in the main patterns observed. Going deliberately after negative and atypical instances is also healthy in itself; it may force you to clarify your concepts, and it may tell you that you indeed have sampled too narrowly.

INSTRUMENTATION

Description and Rationale

Instrumentation comprises specific methods for collecting data. They may be focused on qualitatively or quantitatively organized information and may be loosely to tightly structured. Note that the term *instrumentation* may mean little more than some shorthand devices for observing and

recording events. But note, too, that even when the instrumentation is an open-ended interview or fieldwork observation, some technical choices must be made: Will notes be taken? Of what sort? Will the transaction be audio- or video-recorded? Transcribed?

Kvale and Brinkmann (2015) point out that during an open-ended interview, some analysis and interpretation occur along the way. The person describing his or her "life world" may discover new relationships and patterns during the interview. The researcher who occasionally summarizes or reflects what has been heard is, in fact, condensing and interpreting the flow of meaning. Data are not being collected but rather coauthored.

We've discussed how conceptual frameworks, research questions, and sampling have a focusing role within a study. They give some direction to the researcher, before and during fieldwork, by clarifying what he or she wants to find out from whom and why. Knowing what you want to find out, at least initially, leads to the question of *how* you will get that information. That question, in turn, later determines the analyses you can conduct. If I want to find out how crime suspects are arrested and booked, I may decide to *interview* the people associated with this activity (police officers, suspects, and attorneys); *observe* bookings; and collect arrest-relevant *documents* (e.g., regulations, interrogation transcripts). If permitted, I may also take digital *photographs or video* of arrests and bookings. But how much of this instrumentation has to be designed prior to going out to the field, and how much structure should such instruments have?

There are several possible answers to how much preplanning and structuring of instrumentation is desirable: "little" (i.e., hardly any prior instrumentation) to "a lot" (of prior instrumentation, well structured) to "it depends" (on the nature of the study). Each view has supporting arguments; let's review them in capsule form (Display 2.7 is a summary of some of the main issues in deciding on the appropriate amount of front-end instrumentation).

DISPLAY 2.7 ⬢ Prior Instrumentation: Key Decision Factors

Little Prior Instrumentation	"It Depends"	A Lot of Prior Instrumentation
Rich context description needed		Context less crucial
Concepts inductively grounded in local meanings		Concepts defined ahead by researcher
Exploratory, inductive		Confirmatory, theory-driven
Descriptive intent		Explanatory intent
"Basic" research emphasis		Applied, evaluation or policy emphasis
Single case		Multiple cases
Comparability not too important		Comparability important
Simple, manageable, single-level case		Complex, multilevel, overloading case
Generalizing not a concern		Generalizability/representativeness important
Need to avoid researcher impact		Researcher impact of less concern
Qualitative only, freestanding study		Multimethod study, quantitative included

Source: Miles, M. B., & Huberman, A. M. (1994). *Qualitative data analysis: An expanded sourcebook* (2nd ed.). Thousand Oaks, CA: Sage Publications.

Arguments for Little Prior Instrumentation

1. Predesigned and structured instruments blind the researcher to the site. If the most important phenomena or underlying concepts at work in the field are not collected through the instruments, they will be overlooked or misrepresented.
2. Prior instrumentation is usually stripped of context for purposes of universality, uniformity, and comparability. But qualitative research lives and breathes through seeing site-specific contexts; it is the particularities that produce the generalities, not the reverse.
3. Many qualitative studies involve single cases with few people involved. Who needs standardized questionnaires, observation schedules, or tests—whose usual function is to yield economical, comparable, and parametric distributions for large samples?
4. The lion's share of fieldwork consists of taking field notes; recording events (conversations, meetings); interviewing participants; and examining things (documents, products, artifacts). *Instrumentation* is a misnomer; some orienting questions for observations may be all you need at the start.

Arguments for a Lot of Prior Instrumentation

1. If you know what you are after, there is no reason not to plan in advance how to collect the information.
2. If interview protocols or observation schedules are not focused, too much superfluous information will be collected. An overload of data will compromise the efficiency and power of the analysis.
3. Using the same instruments as in prior studies is an efficient way to converse across studies. Otherwise, the work will be noncomparable, except in a very global way. We need common instruments to construct explanations or predictions, and to make recommendations about practice.
4. A biased or uninformed researcher will ask partial questions, take selective notes, make unreliable observations, and skew information. The data will be invalid and unreliable. Using validated instruments well is the best guarantee of dependable and meaningful findings.

Arguments for "It Depends"

1. If you are running an *exploratory*, largely descriptive study, you do not really know the parameters or dynamics of a social setting. So, heavy initial instrumentation or closed-ended devices are inappropriate. If, however, you are doing a *confirmatory* study, with relatively focused research questions and a well-bounded sample of persons, events, and processes, then well-structured instrument designs are a logical choice. Within a given study, there can be both exploratory and confirmatory aspects that call for differential front-end structure, or there can be exploratory and confirmatory *times*, with exploration often called for at the outset and confirmation near the end.
2. A *single-case* study calls for less front-end preparation than does a *multiple-case* study. The latter is looking forward to cross-case comparison, which requires some standardization of instruments so that findings can be laid side by side in the course of analysis. Similarly, *a freestanding* study has fewer constraints than a *multimethod* study. A *basic* study often needs less advance organizing than an *evaluation* or *policy* study. In the latter cases, the focus is tighter and the instrumentation more closely keyed to the variables of interest.

3. Much depends on the *case definition* and levels of analysis expected. A researcher studying classroom subculture in an elementary school might choose to look intensively in 3 of the building's 35 classrooms and so probably would be right to start with a looser, orienting set of instruments. If, however, an attempt is made to say something about how classroom subculture issues are embedded in the working culture of the school building as a whole, a more standardized, validated instrument—a teacher survey or a group interview protocol—may also be necessary.

Figure out first what kind of study you are doing and what kind of instruments you are likely to need at different moments within that study, and then go to work on the ones needed at the outset. But in all cases, the amount and type of instrumentation should be a function of your conceptual framework, research questions, and sampling criteria. If not, the tail is likely to be wagging the dog, and later analysis will suffer.

Example

We provide an example of how front-end instrument design can be driven in different ways by a study's scope and focus, showing a mix of predesigned and open-ended instrumentation.

Miles and Huberman's school improvement study was a multiple-case ($N = 12$) project, and the phenomenon under investigation was moderately well (but not fully) understood from prior research. Both of these points suggested that some front-end instruments were likely to be called for. Previous empirical research and cognitive and social-psychological theory both led us to the idea that people will adapt or reinvent practices while using them. Thus, one important research question in the study was this: *In which ways did people redefine, reorganize, or reinvent the new program to use it successfully?*

The *sampling* decisions were straightforward. The question addresses teachers in particular, and to get the answer, we had to observe or interview them or, ideally, do both. We sampled events such as the teacher's first encounter with the innovation, and processes such as assessing the innovation's strong and weak points and making changes in it to fit one's practice.

Let's look at the interview component of the *instrumentation*. We developed a semi-structured interview guide (see Display 2.8). Each field researcher was closely familiar with the guide but had the latitude to use a personally congenial way of asking and sequencing the questions and to segment them appropriately for different respondents.

The guide was designed after field work had begun. An initial wave of site visits had been conducted to get a sense of the context, the participants, and how the school improvement process seemed to be working locally. From that knowledge, we went for a deeper and broader understanding. The interviewer begins by taking the participant back to the time just before he or she was to use the innovation with students, asking for detailed context—what was happening, who the colleagues were, and what feelings they had.

Questions 33 through 36 in Display 2.8 move forward through time, asking how the innovation looked, its ready or unready parts, and what the teacher was doing to prepare for its use. Question 40 comes directly to the research question, assessing the pre-use changes made in the innovation. The probes can be handled in various ways: as aids to help the interviewer flesh out the question, as prompts for items the participant may have overlooked, or as subquestions derived from previous research. Later in the interview, the same question recurs as the interviewer evokes the teacher's retrospective views of early and later use, then moves into the present ("What changes are you making now?") and the future ("What changes are you considering?").

DISPLAY 2.8 ⬢ Excerpts From Interview Guide, School Improvement Study

33. Probably you have a certain idea of how _____looks to you now, but keep thinking back to how it first looked to you then, just before students came. How did it seem to you then?

    Probes:

    _____Clearly connected, differentiated vs. unconnected, confusing

    _____Clear how to start vs. awesome, difficult

    _____Complex (many parts) vs. simple and straightforward

    _____Prescriptive and rigid vs. flexible and manipulatable

34. What parts of aspects seemed ready to use, things you thought would work out OK?

35. What parts or aspects seemed not worked out, not ready for use?

36. Could you describe what you actually did during that week or so before you started using _____with students?

    Probes:

    _____Reading

    _____Preparing materials

    _____Planning

    _____Talking (with whom, about what)

    _____Training

. . . .

40. Did you make any changes in the standard format for the program before you started using it with students? What kind of changes with things you thought might not work, things you didn't like, things you couldn't do in this school?

    Probes:

    _____Things dropped

    _____Things added, created

    _____Things revised

Source: Miles, M. B., & Huberman, A. M. (1994). *Qualitative data analysis: An expanded sourcebook* (2nd ed.). Thousand Oaks, CA: Sage Publications.

Instrumentation Advice

1. Simply thinking in instrument design terms from the outset strengthens data collection as you go. If you regularly ask, "Given this research question, how can I get an answer?" it will sharpen *sampling* decisions, help clarify *concepts*, and help set *priorities* for actual data collection. You also will learn the skills of redesigning instrumentation as new questions, new subsamples, and new lines of inquiry develop.

2. People and settings in field studies can be observed more than once. Not everything is riding on the single interview or observation. In qualitative research, there is nearly always a second chance. So, front-end instrumentation can be revised—in fact, should be revised. You learn how to ask a question in the site's terms and to look with new eyes at something that began to emerge during the first visit. Instrumentation can be modified steadily to explore new leads, address a revised research question, or interview a new group of participants.

3. In qualitative research, issues of instrument trustworthiness ride largely on the skills of the researcher. Essentially a *person* is observing, interviewing, and recording, while modifying the observation, interviewing, and recording devices from one field visit to the next. Thus, you need to ask about yourself and your colleagues: How trustworthy is this *person* likely to be as an information-gathering instrument? To us, some markers of a good qualitative researcher-as-instrument are

    a. strong familiarity with the phenomenon and the setting under study;
    b. a multidisciplinary approach, as opposed to a narrow grounding or focus in a single discipline or research methodology;
    c. good investigative skills, the ability to draw people out, and meticulous attention to detail;
    d. being comfortable, resilient, and nonjudgmental with participants in the setting; and
    e. a heightened sense of empathetic engagement, balanced with a heightened sense of objective awareness.

We believe that a savvy researcher with excellent social interaction skills is often the best data collection instrument in a qualitative study: sharper, more attentive, people-friendly, worldly wise, and quicker to home in on core processes and meanings about participants and the case.

LINKING QUALITATIVE AND QUANTITATIVE DATA

We have to face the fact that numbers and words are *both* needed if we are to understand the world. The question is not whether the two sorts of data and their associated methods can be linked during study design but whether it should be done, how it will be done, and for what purposes.

Both types of data can be productive for descriptive, exploratory, inductive, and opening-up purposes. And both can be productive for explanatory, confirmatory, and hypothesis-testing purposes. In multiple-case studies, it is possible to rank cases and to benefit from the availability of nonparametric statistical techniques for contrasting them. When words and numbers are combined with the up-close, deep, credible understanding of complex, real-world contexts that characterize good qualitative studies, we have a very powerful mix.

Looked at the other way, qualitative data can help the quantitative side of a study during design by aiding in conceptual framework development, methodological choice(s), research question design, and instrumentation. They can help during data collection by making access and data collection easier. During analysis, they can help by validating, interpreting, clarifying, and illustrating quantitative findings, as well as through strengthening and revising theory.

There is, of course, a long and well-developed tradition of dealing quantitatively with qualitative data: content analysis, where the issue is one of counting the frequency and sequencing of particular words, phrases, concepts, or visual images found in the data (Neuendorf, 2017). Also note the tradition of using quantitative information in anthropological field work; Bernard (2018) includes a helpful compilation of methods.

Approaches to Mixed Methods Designs

Mixed methods is a genre of inquiry that has been gaining ground in several research circles (Creamer, 2018; Creswell & Plano Clark, 2018). Whether you choose to employ some form of quantitative

component in your qualitative study is both an epistemological and a methodological decision that should be driven by your study's needs, not by the assumption that statistics will somehow enhance the rigor and trustworthiness of your study. The reasons cited most often for mixing both genres are to (a) provide analytic texture to your work; (b) compensate for the deficiencies of one genre with the strengths of another; and (c) modify or strengthen the analytic findings when the results of each genre support, corroborate, or contradict each other.

Examples

Analytic Texture

Words alone and numbers alone can each communicate selected facets of experience. But sometimes both, in strategic combination, can add more dimension to the analysis and findings. We offer that when the quantitative accompanies the qualitative, it provides *analytic texture* to a report.

During Miles and Huberman's school improvement study, we gradually became aware of the importance of job mobility and looked at people in our sites who had changed jobs (moving up, out, sideways, or down). It proved helpful to know how many people had moved (75, for 12 sites); how many of these had moved because of their experience with the innovation (83%); and how many were actually upward career moves (35%). Descriptive statistics such as these were useful as data summaries to accompany and support the qualitative findings from interviews.

Quantitizing is the transformation of qualitative data into numeric representations of some kind. We converted some interview data into rating scales or *magnitudes*: the degree of pressure teachers felt to adopt an innovation, their satisfaction with the assistance they received, or the "roughness" or "smoothness" of the implementation. Because our cases were schools, not individuals, this conversion involved examining interviews from different people, checking the degree of agreement, and arriving at a site-level rating. Three- to five-point scales seemed the easiest and most reliable; for example,

- 5 = high, 4 = moderate/high, 3 = moderate, 2 = moderate/low, 1 = low
- 5 = smooth, 4 = mostly smooth, 3 = mixed, 2 = rough, 1 = very rough

In the displays and analysis, we kept the numbers or magnitudes like these closely associated with the words from which we drew the judgment. Many times, a reader has a tacit understanding of what a 2 on a 5-point evaluation scale suggests. In this case, a number succinctly captures the researchers' interpretations of the participants' overall qualitative experiences.

Compensating for Each Genre

Some mixed methodologists disagree whether one paradigm (e.g., the qualitative) compensates for its "deficiencies" with the "strengths" of another paradigm (e.g., the quantitative). Both paradigms are worthy unto themselves as epistemologies and research approaches, and the notion that each one has its own set of deficiencies is a misplaced assumption. Both the quantitative and qualitative bring different gifts to the research enterprise, each one value-adding to the investigation. Nevertheless, a realist perspective must acknowledge that numbers alone do not tell the whole story. And while words alone can spin a glorious narrative, we cannot escape our need to sometimes quantify our experiences with terms such as "most," "few," "excellent," and "only."

McCammon, Saldaña, Hines, and Omasta (2012) received e-mail survey responses from 234 participants about their high school arts experiences. The survey asked for demographic information

(e.g., gender, year of high school graduation, state[s] of high school attendance) as well as participants' ratings to a series of prompts (4 = strongly agree, 3 = agree, 2 = disagree, 1 = strongly disagree), and it provided space for an open-ended qualitative commentary to the prompts. The demographic information provided descriptive statistics such as percentages. The ratings provided means and other statistics for various significance tests. The open-ended survey responses were qualitatively coded and analyzed.

The respondents' mean rating to the survey prompt, "My participation in high school speech and/or theatre has affected the adult I am now," was 3.82 (veering toward "strongly agree") out of a possible 4.00. This is an impressive statistic that supports the perceived impact of the subject areas on their former students. But *why* such a high rating? This is where qualitative analysis enters to support and explain the quantitative result. The open-ended follow-up prompt to the survey item was, "In what ways do you think your participation in speech and/or theatre as a high school student has affected the adult you have become?" Respondents' written testimony permitted us to code and categorize their perceptions to learn that the major outcomes of participation in speech and/or theatre are self-confidence, enhanced thinking and work habits, identity formation, and emotional growth.

This mixed methods design also enabled us to compare means between various groupings (e.g., between men and women, between younger and older respondents) and apply a two-tailed t test to discern any significant statistical differences ($p < .05$), followed by a qualitative comparison of codes. After a few initial queries, we observed *paradigmatic corroboration*: In other words, the lower and more significant the p level, the more qualitative differences seemed to appear between groups; conversely, when the p level was moderate or high and thus less significant, the fewer qualitative differences we could detect between the groups. In this case, sequential quantitative and qualitative analyses and findings supported one another.

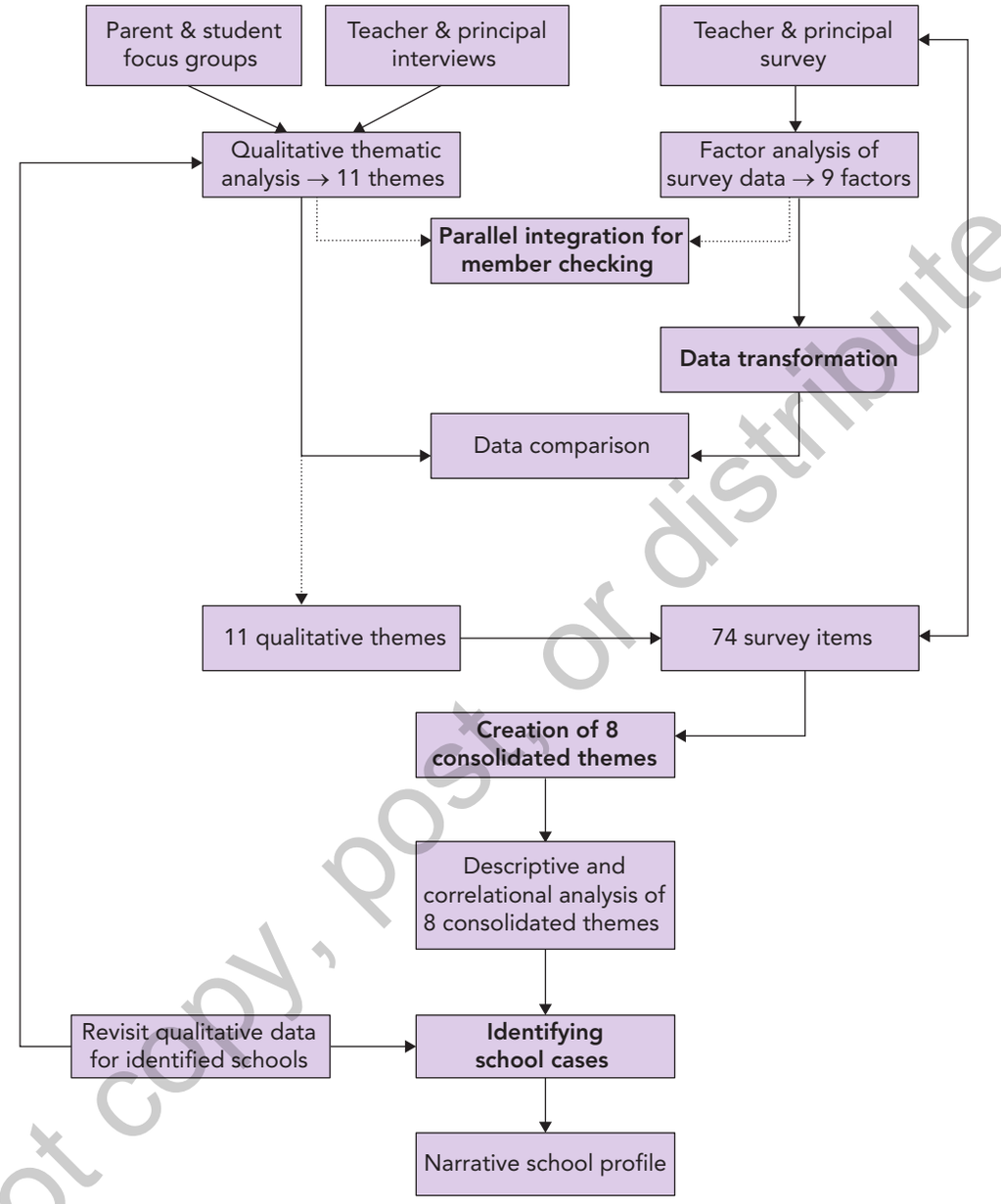
Strengthening Analytic Findings

A third reason for conducting a mixed methods study is to modify or strengthen the analytic findings when the results of both the qualitative and quantitative components support, corroborate, or contradict each other. Contradictions in findings—the lack of paradigmatic corroboration—do not always suggest faulty instrumentation or noncomparable data sets. Rather, the discrepant results suggest that deeper analytic work and reflection are needed to resolve the inconsistencies in order to make emergent insights on why the variability exists.

Mixed methodologists strongly recommend that final reports graphically illustrate the qualitative and quantitative data collection and analytic trajectories of the study and their integrated blending. Display 2.9 exhibits that model from Jang, McDougall, Pollon, Herbert, and Russell's (2008) study on improving urban schools facing challenging circumstances. Qualitative data collection is mapped in the upper left of the display, quantitative data collection in the upper right, and their mixing in the center bins. A careful read of the bins' contents will show the participant samples, the instrumentation used, and the analytic moves to mix the two data forms. The coauthors explain:

> The results from the parallel analyses of the qualitative and quantitative data were compared together for synthesis through data transformation. The results from the survey data were transformed into narrative descriptions of the nine factors. Although both strands captured some overlapping aspects of school improvement, the results from the qualitative data provided additional information about the characteristics of school improvement. Furthermore, *inconsistencies were also observed*. Whereas the qualitative data indicated

DISPLAY 2.9 ⬢ Mixed Methods Data-Analytic Procedures



Source: Jang et al. (2009), p. 230.

> variability in school practice among the schools, the survey data did not show much difference in school staff members' perspectives about school improvement. Therefore, we took integrative analytic approaches using data consolidation and case analytic strategies to gain an in-depth understanding of the causes of these inconsistencies. (Jang et al., 2008, p. 229; emphasis added)

Perhaps the most compelling part of this study is its focus on mixed methodology and the coauthors' analytic journey as they consolidated the themes extracted from each paradigm. Display 2.9 might also serve as inspiration for qualitative research-only studies to display *their* data collection and analytic moves.

Mixed Methods Advice

1. Consider whether your qualitative study can benefit from a quantitative component. Think *purposes* and think ahead: In light of my research questions and the audiences for my study report, will qualitative information be enough or should it be complemented by a numerical data set of some kind?
2. During study design, you are setting up the social system of the project. If you are a lone researcher, can you manage both sorts of information? What technical support might you need? We advise finding and using a mentor who can advise you; critique products; and provide a supportive, different perspective.
3. If you are part of a research team, what will be the consequences of a specific division of labor? In our experience, for example, keeping qualitative and quantitative researchers separate can feed negative comparisons, stereotyping, and sterile arguments about "which data you trust more."

DATA MANAGEMENT ISSUES BEARING ON ANALYSIS

How a qualitative study is managed from Day 1 strongly influences the kinds of analyses that can be done, and how easily. Qualitative studies, especially those done by the lone researcher or the novice graduate student, can be notorious for their vulnerability to poor study management. Kvale and Brinkmann (2015) point out a naive question from a beginner: "How shall I find a method to analyze the 1,000 pages of interview transcripts I have collected?" Their reply is, "Never conduct interview research in such a way that you find yourself in a situation where you ask such a question" (pp. 215–216).

We make no pretense of being exhaustive on issues of study management but want to point to a series of issues with strong implications for analysis. We deal with three topics in turn: data management, the use of computers and software, and staffing/time planning.

Data Management

Typically, large amounts of data come from several sources, cases, or sites, and sometimes include numerical data sets as well. The total collection is termed an *archive*, a *data corpus*, or an assemblage of *empirical materials*. Regardless of what you call them, the main issues are ensuring (a) high-quality, accessible data; (b) documentation of just what analyses have been carried out; and (c) retention of data and associated analyses after the study is complete. Many questions are at hand, but they boil down to these: What do I need to anticipate in the way of data management requirements? How thorough do I need to be? Below we present an ideal wish list of needs to be included in the data that are managed in a project and retained afterwards:

1. Raw material: field notes, digital recordings/photographs, site documents, etc.
2. Partially processed data: write-ups; transcriptions; initial versions; and subsequent corrected, "cleaned," "commented-on" versions
3. Coded data: write-ups with specific codes or themes attached
4. The coding scheme or codebook, in its successive iterations

5. Jottings, analytic memos, or other analytic material; the researcher's reflections on the conceptual meaning of the data
6. Search and retrieval records: information showing which coded units or data segments the researcher looked for during analysis, and the retrieved material; records of links made among segments
7. Data displays: matrices, networks, graphics, etc., used to display retrieved information, along with the associated analytic text; revised versions of these
8. Analysis episodes: documentation of what you did, step by step, to assemble the displays and write the analytic text
9. Report text: successive drafts of what is written on the design, methods, and findings of the study
10. General chronological log or documentation of data collection and analysis work
11. Index of all of the above material

Do you have to set all this up, use it all, and keep it all? No. Will you be better off if you think about these possibilities and their relative importance during the design of the study? Yes. Is it easier to do it with the right software? Yes, two or three times easier, particularly with Microsoft Word and Excel. Some CAQDAS programs (discussed next) automatically generate and store material of this sort as you go along. But you will also need a well-organized physical place for storage and retrieval of raw field notes, audio and related media, edited hard copies, and so on. Preliminary organization is key, yet expect to revise and extend your data management system as you go. Institutional Review Boards (discussed further in Chapter 3) may also impose particular requirements for data management, such as the use of pseudonyms and secure storage, to ensure participant anonymity and confidentiality.

Some researchers prefer to keep each form and unit of data as a separate computer file, but in categorized directory folders. For example, a folder labeled "Interviews" contains the files "Interview 1 - Janice," "Interview 2 - Janice," and so on. Others prefer to label folders by case or site with appropriate subfolders, such as a folder named "Janice Data" with subfolders of "Interviews," "Participant Observation," "Photos," and so on.

Saldaña recommends a single master document for a one-person, short-term, qualitative case study. All the data get placed in one "working" file (with the original and complete data sets in separate backup files) that eventually get condensed and transformed into the final report. Interview excerpts, after condensation, are available as participant quotes for the final report. Related chunks of data get cut-and-pasted together as a form of instantaneous categorization.

Finally, remember that most research data are irreplaceable. If they are inadvertently erased, damaged, stolen, or lost in the cloud, you are out of luck. *Back up all of your work.*

Computer and Software Use

It is taken for granted that you need a good desktop or laptop computer to conduct qualitative research. Handwritten field notes, along with audio or video recordings, must be converted into analyzable text, which then needs to be condensed, displayed, and used to draw and verify conclusions. It's also fair to say that the researcher who does not use software beyond programs such as Microsoft Word will be hampered in comparison with those who do. Below

we list some of the most common and frequent tasks qualitative researchers will conduct on a desktop or laptop computer:

1. Making notes in the field
2. Writing up, extending, and revising field notes
3. Transcribing (and in some cases recording) audio- or video-recorded interviews, conversations
4. Coding: attached to segments of text to permit later retrieval
5. Storage: keeping text and other digital materials in an organized database
6. Search and retrieval: locating relevant segments of text and making them available for inspection
7. Data "linking": connecting relevant data segments with each other, forming categories, clusters, or networks of information
8. Analytic memoing: writing reflective commentaries on some aspects of the data as a basis for deeper analysis
9. Content analysis: counting frequencies, sequence, or locations of words and phrases
10. Data display: placing selected data in a condensed, organized format, such as a matrix, network, or graphic
11. Conclusion drawing and verification: aiding the analyst to interpret displayed data and to test or confirm findings
12. Theory building: developing systematic, conceptually coherent explanations of findings; testing hypotheses
13. Graphic mapping: creating diagrams and other displays that depict findings or theories
14. Preparing interim and final reports

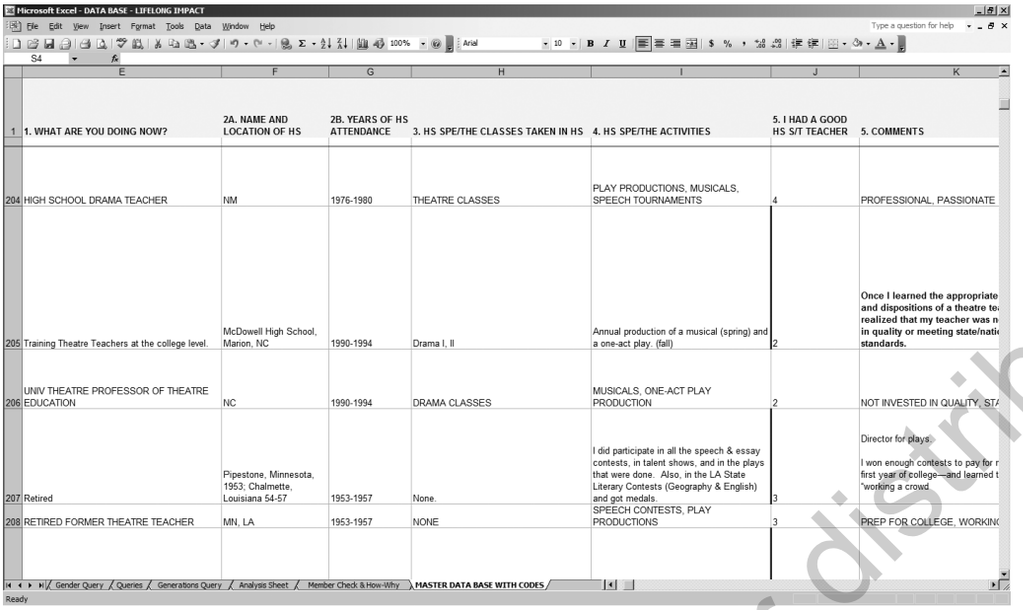
"What software is best?" cannot be answered meaningfully. You have to get specific about the kind of database you are building in your project and about the kind of analysis you will be doing. Microsoft Word and Excel (or comparable programs) are bare minimum requirements. Word includes many layout features for text and enables you to easily construct complex tables and matrices for displays. Excel is most useful for unitizing the database in cells, building matrices, and especially for holding qualitative survey data and taking quantitative data through selected statistical calculations and tests—a boon for mixed methods studies (see Display 2.10).

CAQDAS

CAQDAS (Computer Assisted Qualitative Data Analysis Software) consists of specialized programs designed for qualitative database management and for assisting analysis. The software does not analyze data automatically for the researcher. It relies on your use of its programming commands to code, annotate, retrieve, and array the data in different configurations for analytic reflection and discovery.

CAQDAS is first and foremost an excellent way to store and maintain your data corpus, with some programs storing or accessing digital audio and video, and some that can download Internet data such as social media content. Selected programs visually display which code you've assigned to which unit of data through clear, at-a-glance graphics. Their search and retrieval functions permit rapid access of codes and associated data to construct categories or themes and allow you to test your hunches, hypotheses, and queries; they also keep records of these operations for analytic documentation.

DISPLAY 2.10 ⬢ An Excel Spreadsheet With Qualitative and Quantitative Data



Microsoft Excel - DATA BASE - LIFELONG IMPACT

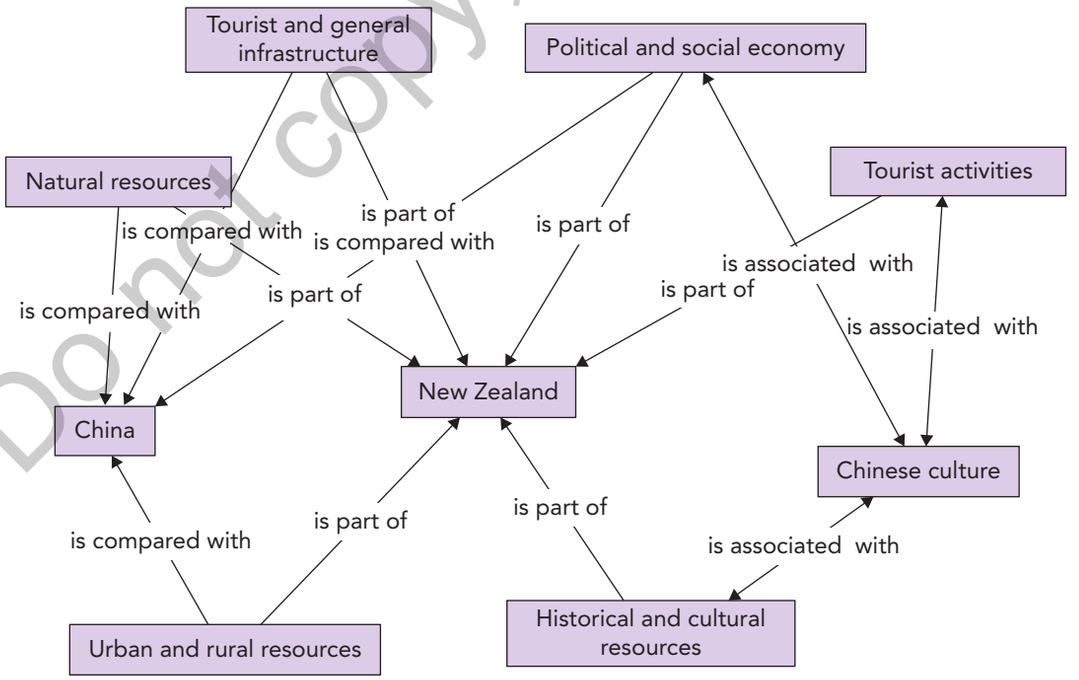
	E	F	G	H	I	J	K
1	1. WHAT ARE YOU DOING NOW?	2A. NAME AND LOCATION OF HS	2B. YEARS OF HS ATTENDANCE	3. HS SPE/THE CLASSES TAKEN IN HS	4. HS SPE/THE ACTIVITIES	5. I HAD A GOOD HS S/T TEACHER	5. COMMENTS
204	HIGH SCHOOL DRAMA TEACHER	NM	1976-1980	THEATRE CLASSES	PLAY PRODUCTIONS, MUSICALS, SPEECH TOURNAMENTS	4	PROFESSIONAL, PASSIONATE
205	Training Theatre Teachers at the college level.	McDowell High School, Marion, NC	1990-1994	Drama I, II	Annual production of a musical (spring) and a one-act play. (fall)	2	Once I learned the appropriate and dispositions of a theatre te realized that my teacher was n in quality or meeting state/nati standards.
206	UNIV THEATRE PROFESSOR OF THEATRE EDUCATION	NC	1990-1994	DRAMA CLASSES	MUSICALS, ONE-ACT PLAY PRODUCTION	2	NOT INVESTED IN QUALITY, STA
207	Retired	Pipestone, Minnesota, 1953; Chalmette, Louisiana 54-57	1953-1957	None.	I did participate in all the speech & essay contests, in talent shows, and in the plays that were done. Also, in the LA State Literary Contests (Geography & English) and got medals.	3	Director for plays. I won enough contests to pay for r first year of college—and learned t "working a crowd
208	RETIRED FORMER THEATRE TEACHER	MN, LA	1953-1957	NONE	SPEECH CONTESTS, PLAY PRODUCTIONS	3	PREP FOR COLLEGE, WORKIN

Gender Query / Queries / Generations Query / Analysis Sheet / Member Check & How-Why / MASTER DATA BASE WITH CODES

Ready

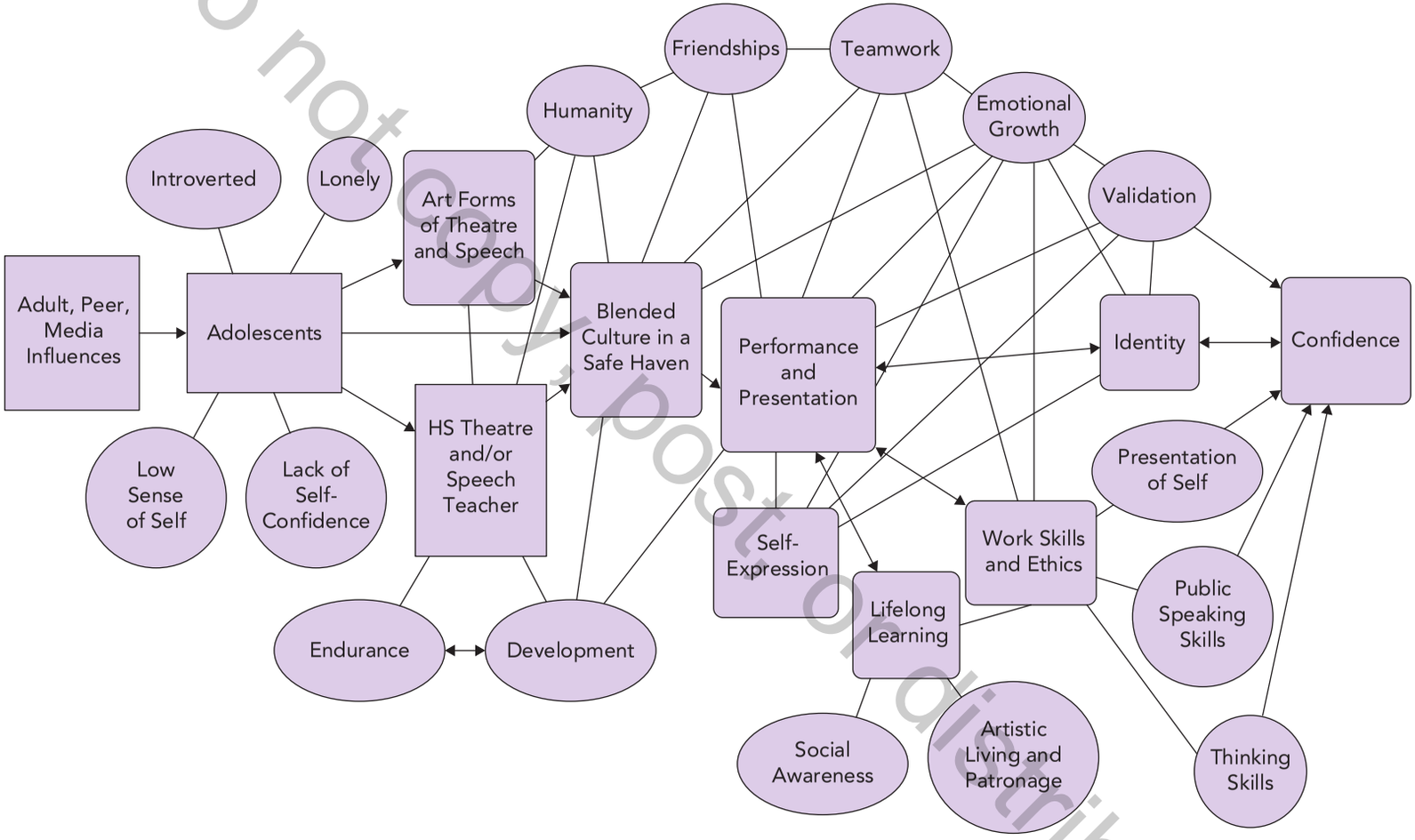
Some programs also feature quantitative/statistical capabilities for mixed methods studies, and more sophisticated CAQDAS packages can construct, with researcher input, semantic networks or other displays with nodes and lines that suggest interrelationships between data chunks or categories. Display 2.11 shows the categories of New Zealand's tourism products (e.g., Natural Resources, Historical and Cultural Resources) as perceived by Chinese tourists (Sun, Ryan, & Pan, 2015, p. 549). The

DISPLAY 2.11 ⬢ Network View Produced by ATLAS.ti



Source: Sun, Ryan, & Pan (2015), p. 549.

DISPLAY 2.12 ⬢ A Model of Lifelong Confidence From High School Speech and Theatre



Source: McCammon, L., Saldaña, J., Hines, A., & Omasta, M. (2012). Lifelong impact: Adult perceptions of their high school speech and/or theatre participation. *Youth Theatre Journal 26*(1), 2–25.

CAQDAS software ATLAS.ti enables researchers to insert not just labels for bins but labels for links ("is part of," "is associated with," "is compared with") for enhanced network analysis.

Saldaña has found the CAQDAS modeling features for network display drawing most helpful and much easier to use than the time-consuming artwork features of text-based programs. Display 2.12 (from McCammon et al., 2012, p. 14) illustrates a complex model of interacting variables leading to participant confidence from participating in high school speech and theatre classes and activities. The model was originally drawn with NVivo 8 software.

There are multiple software options available, varying in complexity, cost, and available functions. These programs' websites provide online tutorials or demonstration software/manual downloads of their most current versions:

- AQUAD: www.aquad.de/en
- ATLAS.ti: www.atlasti.com
- CAT: cat.texifter.com
- Dedoose: www.dedoose.com
- DiscoverText: www.discovertext.com
- HyperRESEARCH: www.researchware.com
- INTERACT: www.mangold-international.com
- MAXQDA: www.maxqda.com
- NVivo: www.qsrinternational.com
- Q-Notes: https://wwwn.cdc.gov/qnotes/
- QDA Miner: www.provalisresearch.com
- Qualrus: www.qualrus.com
- Quirkos: www.quirkos.com
- Studiocode (for video data materials): https://vosaic.com/products/studiocode
- Transana (for audio and video data materials): www.transana.com
- V-Note (for audio and video data materials): www.v-note.org
- WebQDA: www.webqda.net
- Weft QDA: www.pressure.to/qda/
- WordStat: www.provalisresearch.com

Selected CAQDAS programs, such as CAT and Weft QDA, are free of charge but do not provide supplemental technical support.

Online-only programs like TagCrowd (tagcrowd.com), WordItOut (worditout.com), and Wordle (www.wordle.net) enable you to cut-and-paste large amounts of text into a field. The online software then analyzes its word count frequencies and displays the results in a randomized "cloud" design with the more frequent words in a larger font size. These programs employ only basic content-analytic functions yet display results in intriguing visual arrays for analytic reflection. Baral and Pokharel (2017) analyzed the contents of the S&P 500 companies' mission, vision, and values statements to measure the extent to which they reflect the concept of sustainability. Display 2.13 exhibits

the 30 most frequently used words in those three separate statements as word clouds, which served as an analytic heuristic before more complex statistical applications were applied.

We do not recommend one software program over others, and you may find that the scope of your study is so small that a CAQDAS program may not even be needed. But this software is indispensable for longitudinal, large-scale, or multiple-case studies and studies with digital photographs, video data, and Internet-downloaded materials. You should select one that seems compatible with your research needs and personal ways of working, or one that permits multiple-user access for team research projects.

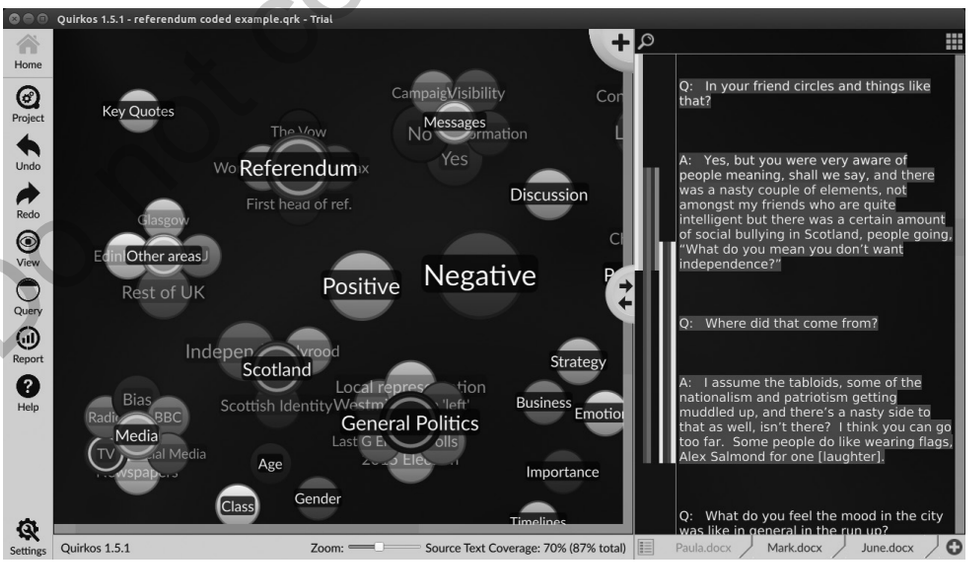
Work initially at a level of computer literacy that is comfortable for you, technically speaking, and extend your understanding with the help of friends whose computer skills are stronger than yours. Although manuals and tutorials supplied with programs can help, the best way to learn a new program is to use it on real tasks with a mentor for consultation. Allow time in your study design for learning new software.

There is ongoing debate within the field about the utility of these software programs for data analysis. No single software program can do everything well. You may end up with several programs (e.g., Word, Excel, and Quirkos; see Display 2.14), each with specific strengths, rather than with one all-purpose package. Transana (see Display 2.15), for example, is indispensable for video data and conversation analysis with the Jefferson notation system. Some CAQDAS programs include wonderful features to support analyses, but there is a steep learning curve for most programs. Invest your time

DISPLAY 2.13 ⬢ Word Clouds of Top 30 Most Frequent Words in the Mission (top), Vision (middle), and Values (bottom) Statements of the S&P 500 Companies

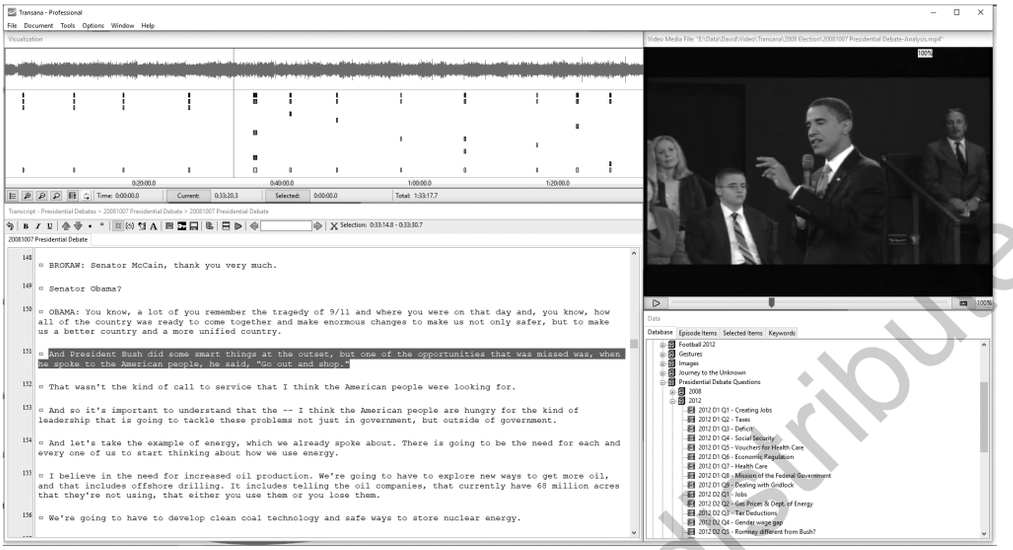
Source: Baral & Pokharel (2017), p. 127.

DISPLAY 2.14 ⬢ A Screenshot of Quirkos CAQDAS Software



Source: Courtesy of Daniel Turner, Quirkos Software; www.quirkos.com.

DISPLAY 2.15 ⬢ A Screenshot of Transana CAQDAS Software



Source: Courtesy of David K. Woods, Transana; www.transana.com.

wisely; spend it more on analyzing data and not on figuring out a software program's operations and syntax. Think critically about what you need as your projects and research career evolve.

CAQDAS is a fast-moving field. Expect the information here to become outdated as new programs are created and updated versions appear. Refer to the appendix for recommended titles in print to supplement the use of basic text programs. We purposely decline to recommend certain software programs over others. To do so would be unfair to the developers, and our personal preferences may not be yours. More about CAQDAS will be discussed throughout later chapters.

Staffing and Time Planning

Qualitative studies are chronically labor intensive, but the details are rarely provided. Here, too, we rely on our experience and that of colleagues.

Who will do the work, and how much time will it take? These innocent questions mask more complexity than you often expect. We've said that lone researchers, new or experienced, should find a critical friend, partner, mentor, or colleague who can supply alternative perspectives, support, and protection from bias. In studies that have more than one staff member, there will always be a diversity of experiences, backgrounds, and skills.

That complexity means that the social system of the project needs attention; it will not develop automatically. It is crucial to build strong relationships with research partners or within larger staffs. We've found it useful, for example, to devote plenty of early time to work on core issues (the conceptual framework, research questions, sampling) and to more general maintenance issues such as hopes for and worries about the project, reports of "what else is happening in my life," and procedural guidelines for joint work. Research teams are not built in a day. Take time deliberately for startup of the relationship between you and your research partner or the functioning of the research team.

One other rule of thumb we've found useful: Avoid sharp senior-junior divisions of labor, such as having juniors do the field work and the seniors do the analysis and writing. Senior people need to

be directly involved in data collection in order to have a concrete feel for what the field setting is like. You cannot be a principal investigator in a field study without spending time in the field. Junior people will function poorly as "hired hands." Both need to be actively and mutually engaged in thinking about the project and the meaning of emergent findings.

At the start, people rarely have all the skills they need for a study. Allow for learning time on issues such as fluency with new software, use of a new coding method, or drawing data displays. The time estimates we use look something like this: For each day of field work, expect to spend

- 2 or 3 days processing field notes (writing them up, correcting, etc.); if audio or video recordings are being transcribed, the multiple may run from 3 to 5 days, depending on the recording length, fineness of detail, the transcriber's familiarity with the content, and available time;
- 3 to 5 days coding (depending on the fineness and complexity of the evolving scheme); and
- 2 or 3 days completing displays (depending on the number and type of displays).

These are rough estimates for a single case. For a multiple-case study, (a) multiply by the number of cases, (b) consider what cross-case analyses will be carried out and what the within-case and cross-case reports will look like, and (c) make a total-days estimation.

CLOSURE AND TRANSITION

We've looked at substantive moves that focus on the collection of data and condensing it. These moves include systematic *conceptual frameworks* of variables or concepts and their interrelationships, *research questions* that further define the inquiry, bounding the core and parameters of a study through *case definition*, planning for within-case and multiple-case *sampling*, and creating *instrumentation*. All of these moves serve to both constrain and support analysis. Such choices depend on not only your preferred research style but also the study's topic and goals, available theory, and the researcher's familiarity with the settings being studied.

Added design issues that make a big difference in analysis include how qualitative data may be linked with *quantitative information* from the same setting, and a series of nuts-and-bolts management issues. Careful decisions about which *computer software* to use for what purposes need to be made. A systematic plan for *data management*—storage and retrieval of everything from data to final study reports—is equally important. Building good colleague and staff *relationships* is essential, as is initial and recurring *time* planning.

In the next chapter, we examine the more human dimensions of field work and analysis through the perspectives of the participants and our ethical obligations to them.