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## A (VERY) BRIEF REFRESHER ON THE CASE STUDY METHOD

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The case study method embraces the full set of procedures needed to do case study research. These tasks include designing a case study, collecting the study's data, analyzing the data, and presenting and reporting the results. (None of the tasks, nor the rest of this book, deals with the development of *teaching case studies*—frequently also referred to as the “case study method”—the pedagogical goals of which may differ entirely from doing research studies.)

The present chapter introduces and describes these procedures, but only in the most modest manner. The chapter's goal is to serve as a brief refresher to the case study method. As a refresher, the chapter does not fully cover all the options or nuances that you might encounter when customizing your own case study (refer to Yin, 2009a, to obtain a full rendition of the entire method).

Besides discussing case study design, data collection, and analysis, the refresher addresses several key features of case study research. First, an abbreviated definition of a “case study” will help identify the circumstances when you might choose to use the case study method instead of (or as a complement to) some other research method.

Second, other features cover the choices you are likely to encounter in doing your own case study. Thus, the refresher discusses the

- definition of the “case” in case study research,
- benefits of developing a theoretical perspective in conjunction with your design and analysis tasks,
- importance of triangulating among data sources,
- desired vigor in entertaining rival explanations during data collection, and
- challenge of generalizing from case studies.

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**AUTHOR'S NOTE:** This chapter was written expressly for this book but draws from three previous summaries of the case study method (Yin, 2006, 2009b, and 2011a).

To maintain its brevity, the refresher gives less attention to the reporting phase of case studies, although a few words of advice are still offered with regard to presenting case study evidence.

The refresher concludes by discussing the positioning of the case study method among other social science methods, such as experiments, quasi-experiments, surveys, histories, and statistical analyses of archival data. The conclusion suggests the possibility that case study research is not merely a variant of any of these other social science methods, such as quasi-experiments or qualitative research, as has been implied by other scholars. Rather, case study research follows its own complete method (see Yin, 2009a).

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## A. CASE STUDIES AS A RESEARCH (NOT TEACHING) METHOD

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### **An Abbreviated Definition**

All case study research starts from the same compelling feature: the desire to derive a(n) (up-)close or otherwise in-depth understanding of a single or small number of “cases,” set in their real-world contexts (e.g., Bromley, 1986, p. 1). The closeness aims to produce an invaluable and deep understanding—that is, an insightful appreciation of the “case(s)”—hopefully resulting in new learning about real-world behavior and its meaning. The distinctiveness of the case study, therefore, also serves as its abbreviated definition:

*An empirical inquiry about a contemporary phenomenon (e.g., a “case”), set within its real-world context—especially when the boundaries between phenomenon and context are not clearly evident (Yin, 2009a, p. 18).*

Thus, among other features, case study research assumes that examining the context and other complex conditions related to the case(s) being studied are integral to understanding the case(s).

The in-depth focus on the case(s), as well as the desire to cover a broader range of contextual and other complex conditions, produce a wide range of topics to be covered by any given case study. In this sense, case study research goes beyond the study of isolated variables. As a by-product, and as a final feature in appreciating case study research, the relevant case study data are likely to come from multiple and not singular sources of evidence.

### **When to Use the Case Study Method**

At least three situations create relevant opportunities for applying the case study method as a research method. First and most important, the choices among

different research methods, including the case study method, can be determined by the kind of research question that a study is trying to address (e.g., Shavelson & Towne, 2002, pp. 99–106). Accordingly, case studies are pertinent when your research addresses either a *descriptive* question—“What is happening or has happened?”—or an *explanatory* question—“How or why did something happen?” As contrasting examples, alternative research methods are more appropriate when addressing two other types of questions: an initiative’s effectiveness in producing a particular outcome (experiments and quasi-experiments address this question) and how often something has happened (surveys address this question). However, the other methods are not likely to provide the rich descriptions or the insightful explanations that might arise from doing a case study.

Second, by emphasizing the study of a phenomenon within its real-world context, the case study method favors the collection of data in natural settings, compared with relying on “derived” data (Bromley, 1986, p. 23)—for example, responses to a researcher’s instruments in an experiment or responses to questionnaires in a survey. For instance, education audiences may want to know about the following:

- How and why a high school principal had done an especially good job
- The dynamics of a successful (or unsuccessful) collective bargaining negotiation with severe consequences (e.g., a teachers’ strike)
- Everyday life in a special residential school

You could use a questionnaire or other instrument to study these situations, but doing some original fieldwork, as part of a case study, might go further in helping you best understand them.

Third, the case study method is now commonly used in conducting evaluations. Authoritative sources such as the U.S. Government Accountability Office (1990) and others (e.g., Yin, 1992, 1994, 1997) have documented the many evaluation applications of the case study method.

## **Caveats and Concerns in Doing Case Study Research**

Despite its apparent applicability in studying many relevant real-world situations and addressing important research questions, case study research nevertheless has not achieved widespread recognition as a method of choice. Some people actually think of it as a method of last resort. Why is this?

Part of the notoriety comes from thinking that case study research is the *exploratory* phase for using other social science methods (i.e., to collect some data to determine whether a topic is indeed worthy of further investigation). In this mode, case study research appears to serve only as a prelude. As a result, it may not be considered as involving a serious, much less rigorous, inquiry. However, such a traditional and sequential (if not hierarchical) view of social science methods is entirely outdated. Experiments and surveys have their own exploratory modes, and case study research goes well beyond exploratory functions. In other

words, all the methods can cover the entire range of situations, from initial exploration to the completion of full and final authoritative studies, without calling on any other methods.

A second part of the notoriety comes from a lack of trust in the credibility of a case study researcher's procedures. They may not seem to protect sufficiently against such biases as a researcher seeming to find what she or he had set out to find. They also may suffer from a perceived inability to generalize the case study's findings to any broader level.

Indeed, when case study research is done poorly, these and other challenges can come together in a negative way, potentially re-creating conventional prejudices against the case study method. In contrast, contemporary case study research calls for meeting these challenges by using more systematic procedures. As briefly introduced in this chapter, case study research involves systematic data collection and analysis procedures, and case study findings can be generalized to other situations through analytic (not statistical) generalization.

At the same time, the limited length of this chapter precludes a full rendition of how to deal with all the methodological challenges—such as addressing concerns regarding *construct validity*, *internal validity*, *external validity*, and *reliability* in doing case study research. You should consult the companion text for a fuller discussion of how the case study method handles these concerns (see Yin, 2009a, pp. 40–45).

## B. THREE STEPS IN DESIGNING CASE STUDIES

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Explicitly attending to the design of your case study serves as the first important way of using more systematic procedures when doing case study research. The needed design work contrasts sharply with the way that many people may have stumbled into doing case studies in an earlier era. When doing contemporary case studies, three steps provide a helpful framework for the minimal design work.

### 1. Defining a "Case"

The first step is to define the "case" that you are studying. Arriving at even a tentative definition helps enormously in organizing your case study. Generally, you should stick with your initial definition because you might have reviewed literature or developed research questions specific to this definition. However, a virtue of the case study method is the ability to redefine the "case" after collecting some early data. Such shifts should not be suppressed. However, beware when this happens—you may then have to backtrack, reviewing a slightly different literature and possibly revising the original research questions.

A "case" is generally a bounded entity (a person, organization, behavioral condition, event, or other social phenomenon), but the boundary between the case and its contextual conditions—in both spatial and temporal dimensions—may be blurred, as previously noted. The case serves as the main *unit of analysis* in a case

study. At the same time, case studies also can have nested units within the main unit (see “embedded subcases” in the next section).

In undertaking the definitional task, you should set a high bar: Think of the possibility that your case study may be one of the few that you ever complete. You might, therefore, like to put your efforts into as important, interesting, or significant a case as possible.

What makes a case special? One possibility arises if your case covers some distinctive if not *extreme*, *unique*, or *revelatory* event or subject, such as

- the revival or renewal of a major organization,
- the creation and confirmed efficacy of a new medical procedure,
- the discovery of a new way of reducing gang violence,
- a critical political election,
- some dramatic neighborhood change, or even
- the occurrence and aftermath of a natural disaster.

By definition, these are likely to be remarkable events. To do a good case study of them may produce an exemplary piece of research.

If no such distinctive or unique event is available for you to study, you may want to do a case study about a *common* or *everyday* phenomenon. Under these circumstances, you need to define some compelling theoretical framework for selecting your case. The more compelling the framework, the more your case study can contribute to the research literature. In this sense, you will have conducted a “special” case study. One popular theme is to choose an otherwise ordinary case that has nevertheless been associated with some unusually successful outcome.

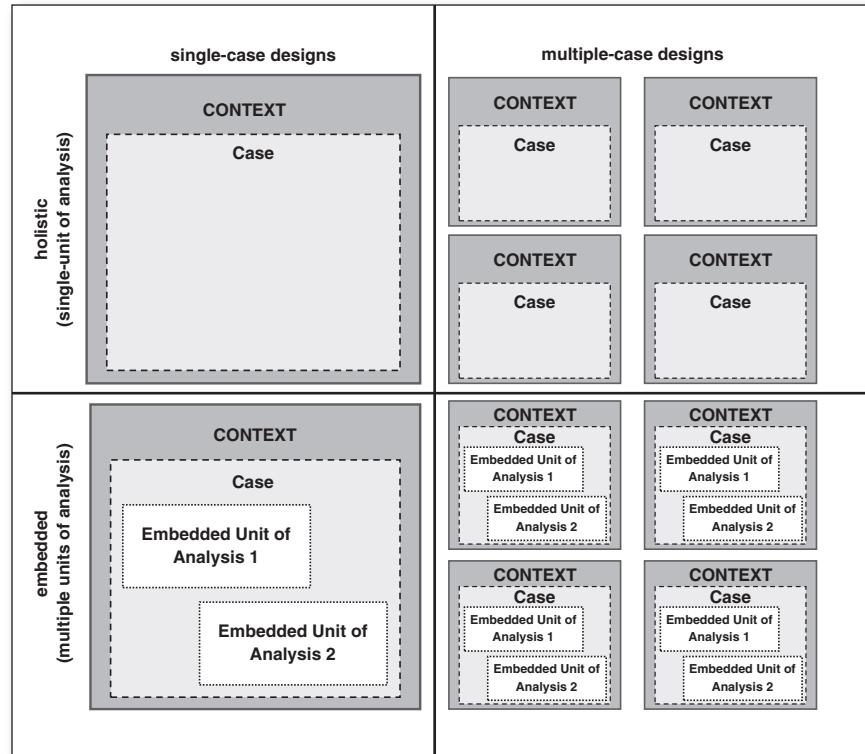
## 2. Selecting One of Four Types of Case Study Designs

A second step calls for deciding whether your case study will consist of a single or multiple cases—what then might be labeled as a *single-* or a *multiple-case study*.<sup>1</sup> Whether single or multiple, you also can choose to keep your case *holistic* or to have *embedded* subcases within an overall holistic case. The resulting two-by-two matrix leads to four different case study designs. These, together with the dashed lines representing the blurred boundary between a case and its context, are illustrated in Figure 1.1.

For example, your holistic case might be about how and why an organization implemented certain staff promotion policies (holistic level), but the study also might include data collected about a group of employees—whether from a sample survey, from an analysis of the employees’ records, or from some other source (the embedded level).<sup>2</sup> If you were limited to a single organization, you would have an embedded, single-case study. If you studied two or more organizations in the same manner, you would have an embedded, multiple-case study.

The multiple-case design is usually more difficult to implement than a single-case design, but the ensuing data can provide greater confidence in your findings. The selection of the multiple cases should be considered akin to the way that you

Figure 1.1 Basic Types of Designs for Case Studies



SOURCE: COSMOS Corporation.

would define a set of multiple experiments—each case (or experiment) aiming to examine a complementary facet of the main research question. Thus, a common multiple-case design might call for two or more cases that deliberately tried to test the conditions under which the same findings might be *replicated*. Alternatively, the multiple cases might include deliberately contrasting cases.

As an important note, the use of the term *replication* in relation to multiple-case designs intentionally mimics the same principle used in multiple experiments (e.g., Hersen & Barlow, 1976). In other words, the cases in a multiple-case study, as in the experiments in a multiple-experiment study, might have been selected either to predict similar results (*direct replications*) or to predict contrasting results but for anticipatable reasons (*theoretical replications*).

An adjunct of the replication parallelism is the response to an age-old question: “How many cases should be included in a multiple-case study?” The

question continues to plague the field to this day (e.g., Small, 2009). Students and scholars appear to assume the existence of a formulaic solution, as in conducting a *power analysis* to determine the needed sample size in an experiment or survey. For case studies (again, as with multiple experiments) no such formula exists. Instead, analogous to the parallel question of “how many experiments need to be conducted to arrive at an unqualified result,” the response is still a judgmental one: the more cases (or experiments), the greater confidence or certainty in a study’s findings; and the fewer the cases (or experiments), the less confidence or certainty.

More important, in neither the case study nor the experimental situation would a tallying of the cases (or the experiments) provide a useful way for deciding whether the group of cases (or experiments) supported an initial proposition or not. Thus, some investigators of multiple-case studies might think that a cross-case analysis would largely consist of a simple tally (e.g., “Five cases supported the proposition, but two did not”) as the way of arriving at a cross-case conclusion. However, the numbers in any such tally are likely to be too small and undistinguished to support such a conclusion with any confidence.

### 3. Using Theory in Design Work

A third step involves deciding whether or not to use *theory* to help complete your essential methodological steps, such as developing your research question(s), selecting your case(s), refining your case study design, or defining the relevant data to be collected. (The use of theory also can help organize your initial data analysis strategies and generalize the findings from your case study—discussed later in this chapter.)

For example, an initial theoretical perspective about school principals might claim that successful principals are those who perform as “instructional leaders.” A lot of literature (which you would cite as part of your case study) supports this perspective. Your case study could attempt to build, extend, or challenge this perspective, possibly even emulating a hypothesis-testing approach. However, such a theoretical perspective also could limit your ability to make discoveries (i.e., to discover from scratch just how and why a successful principal had been successful). Therefore, in doing this and other kinds of case studies, you would need to work with your original perspective but also be prepared to discard it after initial data collection.

Nevertheless, a case study that starts with some theoretical propositions or *theory* will be easier to implement than one having no propositions. The theoretical propositions should by no means be considered with the formality of grand theory in social science but mainly need to suggest a simple set of relationships such as “a [hypothetical] story about why acts, events, structures, and thoughts occur” (Sutton & Staw, 1995, p. 378). More elaborate theories will (desirably) point to more intricate patterns. They (paradoxically) will add precision to the later analysis, yielding a benefit similar to that of having more complex theoretical

propositions when doing quasi-experimental research (e.g., Rosenbaum, 2002, pp. 5–6, 277–279). As an example, in case study evaluations, the use of *logic models* represents a theory about how an intervention is supposed to work.

This desired role of theory sometimes serves as one point of difference between case study research and related qualitative methods such as *ethnography* (e.g., Van Maanen, 1988) and *grounded theory* (e.g., Corbin & Strauss, 2007). For instance, qualitative research may not necessarily focus on any “case,” may not be concerned with a unit of analysis, and may not engage in formal design work, much less encompass any theoretical perspective.

In general, the less experience you have had in doing case study research, the more you might want to adopt some theoretical perspectives. Without them, and without adequate prior experience, you might risk false starts and lost time in doing your research. You also might have trouble convincing others that your case study has produced findings of much value to the field. At the same time, the opposite tactic of deliberately avoiding any theoretical perspective, though risky, can be highly rewarding—because you might then be able to produce a “break-the-mold” case study.

## C. CASE STUDY DATA COLLECTION

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### Varieties of Sources of Case Study Data

Case study research is not limited to a single source of data, as in the use of questionnaires for carrying out a survey. In fact, good case studies benefit from having *multiple sources of evidence*. Exhibit 1.1 lists six common sources of evidence. You may use these six in any combination, as well as related sources such as focus groups (a variant of interviews), depending on what is available and relevant for studying your case(s). Regardless of its source, case study evidence

#### Exhibit 1.1 Six Common Sources of Evidence in Doing Case Studies

1. Direct observations (e.g., human actions or a physical environment)
2. Interviews (e.g., open-ended conversations with key participants)
3. Archival records (e.g., student records)
4. Documents (e.g., newspaper articles, letters and e-mails, reports)
5. Participant-observation (e.g., being identified as a researcher but also filling a real-life role in the scene being studied)
6. Physical artifacts (e.g., computer downloads of employees' work)

can include both *qualitative* and *quantitative data*. Qualitative data may be considered non-numeric data—for instance, categorical information that can be systematically collected and presented in narrative form, such as *word tables*. Quantitative data can be considered numeric data—for instance, information based on the use of ordinal if not interval or ratio measures.

Again, you will have to consult other references to cover all these sources comprehensively (e.g., Yin, 2009a, pp. 98–125). However, a quick review of three of the most common sources will give you an idea of the data collection process.

### **Direct Observations: Two Examples**

Let's start with one of the most common methods: making *direct observations* in a field setting. Such observations can focus on human actions, physical environments, or real-world events. If nothing else, the opportunity to make such observations is one of the most distinctive features in doing case studies.

As an initial example, the conventional manner of collecting observational data takes the form of using your own five senses, taking field notes, and ultimately creating a narrative based on what you might have seen, heard, or otherwise sensed. (The application in Chapter 2 provides an example of such a narrative.) Mechanical devices such as audiotape recorders or audio-video cameras also can help.

Based on these observations, the composing of the narrative must overcome the caveat discussed earlier by presenting the observational evidence along with a careful note: whether the presentation represents your trying to be as neutral and factual as possible, whether it represents the view of (one or more of) the field participants in your case study, or whether it represents your own deliberate interpretation of what has been observed. Any of the three is acceptable, depending on the goal of your data collection, but you must explicitly clarify which of the three is being presented and avoid confusing them inadvertently. Once properly labeled, you even may present information from two different points of view, again depending on the goal of your data collection and case study.

Besides this traditional observational procedure, a second way of making direct observations comes from using a formal observational instrument and then noting, rating, or otherwise reporting the observational evidence under the categories specified by the instrument. Use of a formal workplace instrument, aimed at defining the frequency and nature of supervisor-employee interactions, is a commonplace practice in doing management research. Such an instrument allows the observational evidence to be reported in both narrative and tabular forms (e.g., tables showing the frequency of certain observations). In a similar manner, a formal instrument can be used to define and code other observed interactions, such as in a study of the two-way dialogue between a doctor and a patient or between a teacher and a class. In any of these situations, the interactions may have been observed directly or recorded with an audio-visual device.

## Open-Ended Interviews

A second common source of evidence for case studies comes from *open-ended interviews*, also called “nonstructured interviews.” These interviews can offer richer and more extensive material than data from surveys or even the open-ended portions of survey instruments. On the surface, the open-ended portions of surveys may resemble open-ended interviews, but the latter are generally less structured and can assume a lengthy conversational mode not usually found in surveys. For instance, the open-ended interviews in case studies can consume two or more hours on more than a single occasion. Alternatively, the conversations can occur over the course of an entire day, with a researcher and one or more participants accompanying one another to view or participate in different events.

The flexible format permits open-ended interviews, if properly done, to reveal how case study participants construct reality and think about situations, not just to provide the answers to a researcher’s specific questions and own implicit construction of reality. For some case studies, the participants’ construction of reality provides important insights into the case. The insights gain even further value if the participants are key persons in the organizations, communities, or small groups being studied, not just the average member of such groups. For a case study of a public agency or private firm, for instance, a key person would be the head of the agency or firm. For schools, the principal or a department head would carry the same status. Because by definition only one or a few persons will fill such roles, their interviews also have been called “elite” interviews.

## Archival Records

In addition to direct observations and open-ended interviews, a third common source consists of archival data—information stored in existing channels such as electronic records, libraries, and old-fashioned (paper) files. Newspapers, television, and the mass media are but one type of channel. Records maintained by public agencies, such as public health or law enforcement or court records, serve as another. The resulting archival data can be quantitative or qualitative (or both).

From a research perspective, the archival data can be subject to their own biases or shortcomings. For instance, researchers have long known that police records of *reported crime* do not reflect the actual amount of crime that might have occurred. Similarly, school systems’ reports of their enrollment, attendance, and dropout rates may be subject to systematic under- or overcounting. Even the U.S. Census struggles with the completeness of its population counts and the potential problems posed because people residing in certain kinds of locales (rural and urban) may be undercounted.

Likewise, the editorial leanings of different mass media are suspected to affect their choice of stories to be covered (or not covered), questions to be asked (or not asked), and textual detail (or lack of detail). All these editorial choices can collectively produce a systematic bias in what would otherwise appear to be a full and factual account of some important event.

Case studies relying heavily on archival data need to be sensitive to these possible biases and take steps to counteract them, if possible. With mass media, a helpful procedure is to select two different media that are believed, if not known, to have opposing orientations (e.g., Jacobs, 1996). A more balanced picture may then emerge. Finding and using additional sources bearing on the same topic would help even more.

## Triangulating Evidence From Multiple Sources

The availability of data from the preceding as well as the three other common sources in Exhibit 1.1 creates an important opportunity during case study data collection: You should constantly check and recheck the consistency of the findings from different as well as the same sources (e.g., Duneier, 1999, pp. 345–347). In so doing, you will be *triangulating*—or establishing converging lines of evidence—which will make your findings as robust as possible.

How might this *triangulation* work? The most desired convergence occurs when three (or more) independent sources all point to the same set of events, facts, or interpretations. For example, what might have taken place at a group meeting might have been reported to you (independently) by two or more attendees at the meeting, and the meeting also might have been followed by some documented outcome (e.g., issuance of a new policy that was the presumed topic of the meeting). You might not have been able to attend the meeting yourself, but having these different sources would give you more confidence about concluding what had transpired than had you relied on a single source alone.

Triangulating is not always as easy as the preceding example. Sometimes, as when you interview different participants, all appear to be giving corroborating evidence about how their organization works—for example, how counselors treat residents in a drug treatment facility. But in fact, they all may be echoing the same institutional “mantra,” developed over time for speaking with outsiders (such as researchers or media representatives), and the collective “mantra” may not necessarily coincide with the organization’s actual practices.

Reviewing the literature may help you anticipate this type of situation, and making your own direct observations also may be extremely helpful. However, when relying on direct observations, note that another problem can arise. Because you may have prescheduled your presence in a field setting, the participant(s) may have had the opportunity to customize their routines just for you. So, getting at the actual practices in the organization or among a group of people may not be as easy as you might think. Nevertheless, you always will be better off using multiple rather than single sources of evidence.

## Using a Case Study Protocol

In collecting your data, and regardless of your sources of evidence, you will find the development and use of a *case study protocol* to be extremely helpful, if not essential. The typical protocol consists of a set of questions to be addressed

while collecting the case study data (whether actually taking place at a field setting or at your own desk when extracting information from an archival source).

Importantly, the questions in the protocol are directed at the researcher, *not* at any field participant. In this sense, the protocol differs entirely from any instrument used in a conventional interview or survey. The protocol's questions in effect serve as a mental framework, not unlike similar frameworks held by detectives investigating crimes, by journalists chasing a story, or by clinicians considering different diagnoses based on a patient's symptoms. In those situations, a detective, journalist, or clinician may privately entertain one or more lines of inquiry (including rival hypotheses), but the specific questions posed to any participant are tuned to each specific interview situation. Thus, the questions as actually verbalized in an interview derive from the line of inquiry (e.g., mental framework) but do not come from a verbatim script (e.g., questionnaire).

### **Collecting Data About Rival Explanations**

A final data collection topic stresses the role of seeking data to examine *rival explanations*. The desired rival thinking should draw from a continual sense of *skepticism* as a case study proceeds. During data collection, the skepticism should involve worrying about whether events and actions are as they appear to be and whether participants are giving candid responses. Having a truly skeptical attitude will result in collecting more data than if rivals were not a concern. For instance, data collection should involve a deliberate and vigorous search for “discrepant evidence,” as if you were trying to establish the potency of the plausible rival rather than seeking to discredit it (Patton, 2002, p. 276; Rosenbaum, 2002, pp. 8–10). Finding no such evidence despite a diligent search again increases confidence about your case study's later descriptions, explanations, and interpretations.

Rival explanations are not merely alternative interpretations. True *rivals* compete directly with each other and cannot coexist. In other words, research interpretations may be likened to a combatant who can be challenged by one or more rivals. Rivals that turn out to be more plausible than an original interpretation need to be rejected, not just footnoted.

Case study research demands the seeking of rival explanations throughout the research process. Interestingly, the methodological literature offers little inkling of the kinds of substantive rivals that might be considered by researchers, either in doing case study research or other kinds of social science research. The only rivals to be found are methodological but not substantive ones—for instance, involving the null hypothesis, experimenter effects, or other potential artifacts created by the research procedures.<sup>3</sup> In contrast, in detective work, a substantive rival would be an alternative explanation of how a crime had occurred, compared with the explanation that might originally have been entertained.

### **Presenting Case Study Evidence**

Properly dealing with case study evidence requires a final but essential practice: You need to present the evidence in your case study with sufficient clarity

(e.g., in separate texts, tables, and exhibits) to allow readers to judge independently your later interpretation of the data. Ideally, such evidence will come from a formal *case study database* that you compile for your files after completing your data collection.

Unfortunately, older case studies frequently mixed evidence and interpretation. This practice may still be excusable when doing a unique case study or a revelatory case study, because the insights may be more important than knowing the strength of the evidence for such insights. However, for most case studies, mixing evidence and interpretation may be taken as a sign that you do not understand the difference between the two or that you do not know how to handle data (and hence proceeded prematurely to interpretation).

## D. CASE STUDY DATA ANALYSIS

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Case study analysis takes many forms, but none yet follow the routine procedures that may exist with other research methods. The absence of any cookbook for analyzing case study evidence has been only partially offset by the development of prepackaged computer software programs. They can support the analysis of large amounts of narrative text by following your instructions in coding and categorizing your notes or your verbatim transcripts. However, unlike software for analyzing numeric data, whereby an analyst provides the input data and the computer uses an algorithm to estimate some model and proceeds to produce the output data, there is no automated algorithm when analyzing narrative data.

Whether using computer software to help you or not, you will be the one who must define the codes to be used and the procedures for logically piecing together the coded evidence into broader themes—in essence creating your own unique algorithm befitting your particular case study. The strength of the analytic course will depend on a marshaling of claims that use your data in a logical fashion.

Your analysis can begin by systematically organizing your data (narratives and words) into hierarchical relationships, matrices, or other arrays (e.g., Miles & Huberman, 1994). A simple array might be a *word table*, organized by some rows and columns of interest and presenting narrative data in the cells of the table. Given this or other arrays, several different analytic techniques can then be used (see Yin, 2009a, pp. 136–161, for a fuller discussion). Discussed next are four examples. The first three are *pattern matching*, *explanation building*, and *time-series analysis*. Multiple-case studies, in addition to using these several techniques within each single case, would then follow a *replication* logic, which is the fourth technique.

### Techniques for Analyzing Case Study Data

If selecting your case(s) to be studied is the most critical step in doing case study research, analyzing your case study data is probably the most troublesome. Much of the problem relates to false expectations: that the data will somehow “speak for themselves,” or that some counting or tallying procedure will be

sufficient to produce the main findings for a case study. Wrong. Instead, consider the following alternatives.

You actually made some key assumptions for your analysis when you defined your research questions and your case. Was your motive in doing the case study mainly to address your research questions? If so, then the techniques for analyzing the data might be directed at those questions first. Was your motive to derive more general lessons for which your case(s) are but examples? If so, your analysis might be directed at these lessons. Finally, if your case study was driven by a discovery motive, you might start your analysis with what you think you have discovered.

Now comes a “reverse” lesson. Realizing that key underlying assumptions for later analysis may in fact have been implicit at the initial stages of your case study, you could have anticipated and planned the analytic strategies or implications when conducting those initial stages. Collecting the actual data may lead to changes in this plan, but having an initial plan that needs to be revised (even drastically) may be better than having no plan at all.

For instance, one possibility is to stipulate some pattern of expected findings at the outset of your case study. A *pattern-matching* logic would later enable you to compare your empirically based pattern (based on the data you had collected) with the predicted one. As later presented in Chapter 10, the prediction in a community study might have stipulated that the patterns of outcomes in many different economic and social sectors (e.g., retail sales, housing sales, unemployment, and population turnover) would be “catastrophically” affected by a key event—the closing of a military base in a small, single-employer town (Bradshaw, 1999). The analysis would then examine the data in each sector, comparing pre-post trends with those in other communities and statewide trends. The pattern-matching results should be accompanied by a detailed explanation of how and why the base closure had (or had not) affected these trends. By also collecting data on and then examining possible rival explanations (e.g., events co-occurring with the key event or other contextual conditions), support for the claimed results would be strengthened even further.

Second, a case study may not have started with any predicted patterns but in fact may have started with an open-ended research question that would lead to the use of an *explanation-building* technique. For instance, Chapter 10 includes a second case study that focused on the demise of a high-tech firm that, only a few years before its demise, had been a *Fortune 50* firm (Schein, 2003). The purpose of the case study was then to build an explanation for the demise, again deliberately entertaining rival explanations.

A third technique mimics the *time-series analyses* in quantitative research. In case study research, the simplest time series can consist of assembling key events into a *chronology*. The resulting array (e.g., a word table consisting of time and types of events as the rows and columns) may not only produce an insightful descriptive pattern but also may hint at possible causal relationships, because any presumed causal condition must precede any presumed outcome condition.

Assuming again the availability of data about rival hypotheses, such information would be used in examining the chronological pattern. When the rivals do not fit the pattern, their rejection considerably strengthens the basis for supporting your original claims.

If the case study included some major intervening event in the midst of the chronological sequence, the array could serve as a counterpart to an *interrupted time series* in experimental research. For instance, imagine a case study in which a new executive assumed leadership over an organization. The case study might have tracked the production, sales, and profit trends before and after the executive's ascendance. If all the trends were in the appropriate upward direction, the case study could begin to build a claim, crediting the new leader with these accomplishments. Again, attending to rival conditions (such as that earlier policies might have been put into place by the new executive's predecessor) and making them part of the analysis would further strengthen the claim.

### **When Sufficient Quantitative Data Are Relevant and Available**

The preceding example was deliberately limited to a situation where a case study did not attempt any statistical analysis, mainly because of a lack of data points other than some simple pre-post comparison. However, case study analyses can assume a different posture when more time intervals are relevant and sufficient data are available. In education, a common single-case design might focus on a school or school district as a single organization of interest (e.g., Supovitz & Taylor, 2005; Yin & Davis, 2007). Within the single case, considerable attention might be devoted to the collection and analysis of highly quantitative student achievement data. For instance, a study of a single school district tracked student performance over a 22-year period (Teske, Schneider, Roch, & Marschall, 2000). The start of the period coincided with a time when the district was slowly implementing an educational reform that was the main subject of the study. The available data then permitted the case study to use statistical models (ordinary least squares) in reading and in mathematics to test the correlation between reform and student performance.

### **Cross-Case Synthesis for Multiple-Case Studies**

Discussed earlier was the desire to apply a *replication logic* in interpreting the findings across the cases in a multiple-case study. The logic for such a cross-case synthesis emulates that used in addressing whether the findings from a set of multiple experiments—too small in number to be made part of any quantitative meta-analysis—support any broader pattern of conclusions.

The replication or corroboratory frameworks can vary. In a *direct replication*, the single cases would be predicted to arrive at similar results. In a

*theoretical replication*, each single case's ultimate disposition also would have been predicted beforehand, but each case might have been predicted to produce a varying or even contrasting result, based on the preconceived propositions. Even more complex could be the stipulation and emergence of a typology of cases based on a multiple-case study.

## E. GENERALIZING FROM CASE STUDIES

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Apart from the techniques just described, a final analytic challenge is to determine whether you can make any *generalizations* from your case study. One available procedure applies well to all kinds of case studies, including the holistic, single-case study that has been commonly criticized for having little or no generalizability value. To understand the process requires distinguishing between two types of generalizing: *statistical generalizations* and *analytic generalizations* (Yin, 2009a, pp. 38–39). For case study research, the latter is the appropriate type.

Unfortunately, most scholars, including those who do case study research, are imbued with the former type. They think that each case represents a sampling point from some known and larger population and cannot understand how a small set of cases can generalize to any larger population. The simple answer is that a single or small set of cases cannot generalize in this manner, nor is it intended to. Furthermore, the incorrect assumption is that statistical generalizations, from samples to universes, are the only way of generalizing findings from social science research.

In contrast, analytic generalizations depend on using a study's theoretical framework to establish a logic that might be applicable to other situations. Again, an appealing parallel exists in experimental science, where generalizing about the findings from a single or small set of experiments does not usually follow any statistical path to a previously defined universe of experiments.<sup>4</sup> Rather, for both case studies and experiments, the objective for generalizing the findings is the same two-step process, as follows.

The first step involves a conceptual claim whereby investigators show how their study's findings have informed the relationships among a particular set of concepts, theoretical constructs, or sequence of events. The second step involves applying the same theoretical propositions to implicate other situations, outside the completed case study, where similar concepts, constructs, or sequences might be relevant. For example, political science's best-selling research work has been a single-case study about the Cuban missile crisis of 1962 (Allison, 1971; Allison & Zelikow, 1999). The authors do not generalize their findings and theoretical framework to U.S.-Cuban relations—or to the use of missiles. They use their theoretical propositions to generalize their findings to the likely responses of national governments when involved in super-power confrontation and international crises.

Making analytic generalizations requires carefully constructed claims (e.g., Kelly & Yin, 2007)—again, whether for a case study or for an experiment. The ultimate generalization is not likely to achieve the status of “proof” in geometry,<sup>5</sup> but the claims must be presented soundly and resist logical challenge. The relevant “theory” may be no more than a series of hypotheses or even a single hypothesis. Cronbach (1975) further clarifies that the sought-after generalization is not that of a conclusion but, rather, more like a “working hypothesis” (also see Lincoln & Guba, 1985, pp. 122–123). Confidence in such hypotheses can then build as new case studies—again, as with new experiments—continue to produce findings related to the same theoretical propositions.

In summary, to the extent that any study concerns itself with generalizing, case studies tend to generalize to other situations (on the basis of analytic claims), whereas surveys and other quantitative methods tend to generalize to populations (on the basis of statistical claims).

## F. COMMENTS ABOUT THE POSITIONING OF THE CASE STUDY METHOD

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The preceding refresher has pointed to the potential relevance of both qualitative *and* quantitative data in doing case study research. This duality reinforces the positioning of the case study method as a method not limited to either type of data. An important correlate is that case study investigators should be acquainted with collecting data from a variety of sources of evidence as well as using a variety of analytic techniques.

Such a realization also runs contrary to two common stereotypes of the case study method. The first is that the method is one of the strands of qualitative research—along with such other strands as narrative research, phenomenology, grounded theory, and ethnography.<sup>6</sup> The second and older stereotype is that the case study method is but one of the designs in quasi-experimental research.<sup>7</sup> Neither stereotype is acceptable today.

Rather, case study research appears to be based on its own separate method, related to but not wholly part of the qualitative or quasi-experimental domains. The case study method has its own design, data collection, and analytic procedures. As one indicator of the separateness of the method, contemporary students and scholars are now able to start and complete their own case studies by using qualitative or quantitative techniques as pointed out throughout this chapter. The existence of the separate craft is readily acknowledged every time someone says she or he would like to do a “case study” as the *main* method for a new study—not unlike the alternative choices of saying one wants to do an experiment, a survey, a history, or a quasi-experiment. Case studies also can and have been used as a companion to these other choices as part of *mixed methods studies*.

At the same time, the case study method is still evolving. New contributions are needed to improve the method’s design, data collection, and analytic procedures. Such tasks pose the ongoing challenge of doing case study research.

## NOTES

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1. The latter also has been called an “extended case study” (Bromley, 1986, p. 8; Buraway, 1991).

2. Note that the embedded arrangement would pertain only as long as the entire study and its main research questions were about the organization in its entirety (e.g., the employee data are used in some way to corroborate the organization’s overall condition). However, if the findings about the employees (but not the organization) become the main findings of the entire study, the original data about the organization as a whole likely will become merely a contextual condition for what in the end would be a study of employee characteristics, not a case study.

3. For a typology of truly substantive rivals, such as rival theories and rival explanations, see Yin (2000). For a parallel discussion in relation to quasi-experimental research, see Rosenbaum (2002).

4. Similarly, experimental psychology has had to address the fear that, from a sampling standpoint, the main generalization from any experiment using college sophomores as subjects can be only to the universe of college sophomores. Recent reviews have extended this concern into a cultural domain, suggesting the potential fallacy of automatically generalizing to universal populations when psychology studies mainly have used white, English-speaking, and middle-income people as subjects (e.g., Henrich, Heine, & Norenzayan, 2010).

5. Statistical generalizations also do not achieve the status of “proof” in geometry but by definition are probabilistic statements. In like manner, a “working hypothesis” as an analytic generalization is a probabilistic statement, too, just not expressed in numerical terms.

6. One popular textbook on qualitative research indeed treats case studies as a separate strand within qualitative research, along with the four other qualitative strands listed in the text (Creswell, 2007).

7. This stereotype was promoted by an early reference to the one-shot–post-test-only design in quasi-experimental research, made in a classic work coauthored by Donald Campbell (Campbell & Stanley, 1966). Though such a design does exist, Campbell later corrected the misperception with the statement, “Certainly the case study as normally practiced should not be demeaned by identification with the one-group post-test-only design,” which then appeared in the textbook that was the successor to the classic work (Cook & Campbell, 1979, p. 96).