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Case Studies and Theory Development in the Social Sciences

Alexander L. George and Andrew Bennett

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We stated earlier that the congruence method applies not only to theories that focus on the causal role of beliefs in decision-making but, as has now been discussed, also to deductive theories associated with the structural realist theory of international relations and more generally to rational choice and game theories.

Chapter 10

Process-Tracing and Historical Explanation

In the last few decades process-tracing has achieved increasing recognition and widespread use by political scientists and political sociologists. David Collier observes that "refinements in methods of small-n analysis have substantially broadened the range of techniques available to comparative researchers." He emphasizes, as we do, that "within-case comparisons are critical to the viability of small-n analysis" and have contributed to the move "to historicize the social sciences."[1] Similarly, Charles Tilly emphasized the importance of what we call process-tracing in urging that theoretical propositions should be based not on "large-N statistical analysis" but on "relevant, verifiable causal stories resting in differing chains of cause-effect relations whose efficacy can be demonstrated independently of those stories."[2]

David Laitin emphasizes the importance of theoretically oriented narratives and process-tracing which, he states, have made a "fundamental contribution . . . in finding regularities through juxtaposition of historical cases. . . . If statistical work addresses questions of propensities, narratives address the questions of process."[3] Jack Goldstone urges that

1. David Collier, "The Comparative Method: Two Decades of Change," in Ada Finifter, ed., *Political Science: The State of the Discipline* (Washington, D.C.: American Political Science Association, 1993), pp. 8–11; 110–112.

2. Charles Tilly, "Means and Ends of Comparison in Macrosociology," *Comparative Social Research*, Vol. 16 (1997), pp. 43–53. The quotation is from p. 48.

3. David D. Laitin, "Comparative Politics: The State of the Subdiscipline," paper presented at the Annual Meeting of the American Political Science Association in Washington, D.C., September 2000, which appears in Helen V. Milner and Ira Katznelson, eds., *Political Science: The State of the Discipline* (New York: Norton, 2002). Quoted material is from pp. 2–5.

process-tracing be emphasized in efforts to explain macrohistorical phenomena: "To identify the process, one must perform the difficult cognitive feat of figuring out *which* aspects of the initial conditions observed, in conjunction with *which simple principles* of the many that may be at work, would have *combined* to generate the observed sequence of events."[4]

Another leading contributor to comparative politics, Peter Hall, also stresses the importance of "theory-oriented process-tracing." Hall observes that "we might usefully turn to the techniques that George (1979) initially termed 'process-tracing' [which] points us in the right methodological direction." He concludes, "In short, process-tracing is a methodology well-suited to testing theories in a world marked by multiple interaction effects, where it is difficult to explain outcomes in terms of two or three independent variables—precisely the world that more and more social scientists believe we confront."[5]

Process-tracing finds a place also in the constructivist approach. Alexander Wendt recognizes that the core of descriptions of causal mechanisms is "process-tracing, which in social science ultimately requires case studies and historical scholarship."[6]

This chapter considerably develops our analyses of process-tracing, dating back to 1979. The process-tracing method attempts to identify the intervening causal process—the causal chain and causal mechanism—between an independent variable (or variables) and the outcome of the dependent variable. Suppose that a colleague shows you fifty numbered dominoes standing upright in a straight line with their dots facing the same way on the table in a room, but puts a blind in front of the dominoes so that only number one and number fifty are visible. She then sends you out of the room and when she calls you back in you observe that domino number one and domino number fifty are now lying flat with their tops pointing in the same direction; that is, they co-vary. Does this mean that either domino caused the other to fall? Not necessarily. Your colleague could have pushed over only dominoes number one and fifty, or bumped the table in a way that only these two dominoes fell, or

4. Jack Goldstone, *Revolution and Rebellion in the Early Modern World* (Berkeley: University of California Press, 1991), pp. 50–62. Emphasis is in the original.

5. Peter A. Hall, "Aligning Ontology and Methodology in Comparative Politics," paper presented at the Annual Meeting of the American Political Science Association in Washington, D.C., September 2000, pp. 14, 18.

6. Alexander Wendt, *Social Theory of International Politics* (Cambridge: Cambridge University Press, 1999), pp. 80–85, 90, 152–156, 370–373. An endorsement of process-tracing appears also in John Ruggie's discussion of the concept of "narrative explanatory protocol," "What Makes the World Hang Together?" *International Organization*, Vol. 52, No. 4 (Autumn 1998), pp. 855–885.

that all the dominoes fell at once. You must remove the blind and look at the intervening dominoes, which give evidence on potential processes. Are they, too, lying flat? Do their positions suggest they fell in sequence rather than being bumped or shaken? Did any reliable observers hear the sound of dominoes slapping one another in sequence? From the positions of all the dominoes, can we eliminate rival causal mechanisms, such as earthquakes, wind, or human intervention? Do the positions of the fallen dominoes indicate whether the direction of the sequence was from number one to number fifty or the reverse?

These are the kinds of questions researchers ask as they use process-tracing to investigate social phenomena. Tracing the processes that may have led to an outcome helps narrow the list of potential causes. Yet even with close observation, it may be difficult to eliminate all potential rival explanations but one, especially when human agents are involved—for they may be doing their best to conceal causal processes. But process-tracing forces the investigator to take equifinality into account, that is, to consider the alternative paths through which the outcome could have occurred, and it offers the possibility of mapping out one or more potential causal paths that are consistent with the outcome and the process-tracing evidence in a single case. With more cases, the investigator can begin to chart the repertoire of causal paths that lead to a given outcome and the conditions under which they occur—that is, to develop a typological theory.

Process-tracing is an indispensable tool for theory testing and theory development not only because it generates numerous observations within a case, but because these observations must be linked in particular ways to constitute an explanation of the case. It is the very lack of independence among these observations that makes them a powerful tool for inference. The fact that the intervening variables, if truly part of a causal process, should be connected in particular ways is what allows process-tracing to reduce the problem of indeterminacy (the problem often misidentified in case studies as the degrees of freedom problem).

Process-tracing is fundamentally different from methods based on covariance or comparisons across cases. In using theories to develop explanations of cases through process-tracing, *all* the intervening steps in a case must be as predicted by a hypothesis (as emphasized later in this chapter), or else that hypothesis must be amended—perhaps trivially or perhaps fundamentally—to explain the case. It is not sufficient that a hypothesis be consistent with a statistically significant number of intervening steps.

Process-tracing complements other research methods. While process-tracing can contribute to theory development and theory testing in ways that statistical analysis cannot (or can only with great difficulty), the

two methods are *not* competitive. The two methods provide different and complementary bases for causal inference, and we need to develop ways to employ both in well-designed research programs on important, complex problems.[7]

Nor is process-tracing incompatible with rational choice approaches. Process-tracing is a research *method;* rational choice models are *theories.* Many proponents of the rational choice approach agree that its efficacy must be judged in part by empirical testing of decision-making processes; process-tracing provides the opportunity to do so. In fact, scholars are using process-tracing within a general rational choice framework to construct detailed historical case studies (or analytic narratives).[8] Elements of a rational choice approach have been used, together with other theories, in developing rounded, more comprehensive explanations of complex events.[9] Similarly, case study methods can be used to test and refine theoretical insights built from deductive frameworks developed in game theory.[10]

However, even when rational choice theory or other formal models predict outcomes with a fairly high degree of accuracy, they do not constitute acceptable causal explanations unless they demonstrate (to the extent the evidence allows) that their posited or implied causal mechanisms were in fact operative in the predicted cases. Adequate causal explanations require empirically substantiated assertions about both the causal effects of independent variables and causal mechanisms or the observed processes that lead to outcomes.

Since process-tracing shares some of the basic features of historical explanation, we discuss the logic of historical explanation and indicate its similarities and differences with various types and uses of process-tracing.[11] Process-tracing takes several different forms, not all of which

7. Chapter 2 illustrates the use of both methods in one research program.

8. Robert Bates et al., *Analytic Narratives* (Princeton, N.J.: Princeton University Press, 1998).

9. See, for example, Jack S. Levy, "The Role of Crisis Management in the Outbreak of World War I," in Alexander L. George, ed., *Avoiding War: Problems of Crisis Management* (Boulder, Colo.: Westview Press, 1991), pp. 62–102; and Brent Sterling, "Policy Choice During Limited War" (Ph.D. dissertation, Georgetown University, Washington D.C., 1998).

10. Steven Weber's book, summarized in the Appendix, "Studies That Illustrate Research Design," illustrates how this can be done. See also Glenn Snyder and Paul Diesing, *Conflict Among Nations* (Princeton, N.J.: Princeton University Press, 1977).

11. For a detailed, rounded discussion of the similarities and differences between historical explanation and uses of history by political scientists to develop and test generalizations of theoretical interest, see "Symposium: History and Theory," *International Security,* Vol. 22, No. 1 (Summer 1997), pp. 5–85.

are seen in historical studies; and process-tracing also has quite a few uses, several of which are not usually encountered in historical studies. These differences stem from process-tracing's emphasis on theory development and theory testing.

Process-tracing can sometimes be used for theory testing and is frequently valuable in theory development. Many theories available thus far on problems of interest in international relations, comparative politics, and U.S. politics are probabilistic statements that do not specify the causal process that leads from the independent variables associated with the theory to variance in the outcomes.[12] Such theories cannot generate predictions or hypotheses about what should be observed regarding this process.[13] For example, the first generation of studies on the democratic peace thesis were correlational studies that seem to indicate that democratic states do not fight each other or seldom do so. While a number of ideas were put forward as possible explanations for this phenomenon, they were not well enough specified to permit use of detailed process-tracing of individual cases to assess whether there is evidence of the causal process implied by these hypotheses.[14]

When case studies employing process-tracing cannot *test* theories that are underspecified, they can play an important role in *development* of theories.[15] Case studies can do so for the democratic peace theory, for example, by identifying one or more causal processes that explain how the fact that two states are both democratic enables them to avoid war-threatening disputes or to resolve disputes without engaging in war or threats of it.

The first part of this chapter briefly discusses several kinds of process-tracing and several kinds of causal processes. Various techniques of process-tracing can be employed for different purposes in different phases and approaches to theory development and testing. The second part of the chapter discusses a variety of uses of process-tracing, emphasizing its use in theory building and development. We also indicate how

12. Theories can be tested in two different ways: by assessing the ability of a theory to predict outcomes, and by assessing the ability of a theory to predict the intervening causal process that leads to outcomes (which we discuss in the present chapter).

13. Over the years, Jack Levy has published a number of articles that emphasize the failure of much early quantitative research on international relations to provide theoretical specification of possible intervening causal processes in correlational findings.

14. For a review of this literature, see Miriam Fendius Elman, ed., *Paths to Peace: Is Democracy the Answer?* (Cambridge, Mass.: MIT Press, 1997).

15. An example of research that makes this kind of contribution is Alexander George and Richard Smoke, *Deterrence in American Foreign Policy,* which is summarized in the Appendix, "Studies That Illustrate Research Design."

process-tracing can be an effective tool for testing theories that are well enough specified to make predictions about processes and causal mechanisms.[16] The chapter concludes by considering the similarities and differences between process-tracing and historical explanation.

Varieties of Process-Tracing

DETAILED NARRATIVE

The simplest variety of process-tracing takes the form of a detailed narrative or story presented in the form of a chronicle that purports to throw light on how an event came about. Such a narrative is highly specific and makes no explicit use of theory or theory-related variables. It may be supportable to some extent by explanatory hypotheses, but these remain tacit. Historical chronicles are a familiar example of what is at best an implicit, atheoretical type of process-tracing.[17]

It should be noted, however, that narrative accounts are not without value. Such atheoretical narratives may be necessary or useful steps toward the development of more theoretically oriented types of process-tracing. A well-constructed detailed narrative may suggest enough about the *possible* causal processes in a case so that a researcher can determine what type of process-tracing would be relevant for a more theoretically oriented explanation.

Some philosophers of history who have tried to clarify the "logic" of historical explanation reject the view that historical explanation requires no more than a description of a sequence of events. They maintain that each step or link in a causal process should be supported by an appropriate law—i.e., a statement of regularity (posited as either universalistic or probabilistic). At the same time, they acknowledge that such "laws" in microcausal explanations are usually so numerous and so platitudinous that historians do not bother to list them in the interest of maintaining the flow of the narrative, unless the explanation offered is controversial.[18]

16. This chapter cites a number of studies that have employed process-tracing; some thirty such examples are briefly summarized in the Appendix, "Studies That Illustrate Research Design."

17. Harry Eckstein labels this type of study as "configurative-ideographic"; Arend Lijphart refers to it as an "atheoretical case study." Harry Eckstein, "Case Study and Theory in Political Science," in Fred I. Greenstein and Nelson W. Polsby, eds., *Handbook of Political Science*, Vol. 7 (Reading, Mass.: Addison-Wesley Press, 1973), pp. 79–138; and Arend Lijphart, "Comparative Politics and the Comparative Method," *American Political Science Review*, Vol. 65, No. 3 (September 1971), pp. 682–693.

18. See Clayton Roberts, *The Logic of Historical Explanation* (University Park: Pennsylvania State University Press, 1996). See the discussion of historical explanation below.

USE OF HYPOTHESES AND GENERALIZATIONS

In a more analytical form of process-tracing, at least parts of the narrative are accompanied with explicit causal hypotheses highly specific to the case without, however, employing theoretical variables for this purpose or attempting to extrapolate the case's explanation into a generalization.

A still stronger form of explanation employs some generalizations—laws either of a deterministic or probabilistic character—in support of the explanation for the outcome; or it suggests that the specific historical explanation falls under a generalization or exemplifies a general pattern.

ANALYTIC EXPLANATION

A substantially different variety of process-tracing converts a historical narrative into an *analytical* causal explanation couched in explicit theoretical forms. The extent to which a historical narrative is transformed into a theoretical explanation can vary. The explanation may be deliberately selective, focusing on what are thought to be particularly important parts of an adequate or parsimonious explanation; or the partial character of the explanation may reflect the investigator's inability to specify or theoretically ground all steps in a hypothesized process, or to find data to document every step.

MORE GENERAL EXPLANATION

In another variety of process-tracing, the investigator constructs a general explanation rather than a detailed tracing of a causal process. The investigator may do this either because the data or theory and laws necessary for a detailed explanation are lacking or because an explanation couched at a higher level of generality and abstraction is preferred for the research objective. A decision to do so is consistent with the familiar practice in political science research of moving up the ladder of abstraction.[19] Such process-tracing does *not* require a minute, detailed tracing of a causal sequence. One may opt for a higher level of generality of explanations in within-case analysis, just as researchers using statistical methods often create larger cells either to obtain categories of broader theoretical significance or to obtain enough cases (in a smaller number of larger cells) to permit statistical analysis.

Process-tracing can be applied also to the explanation of macrophenomena, as it often is in economics, as well as to microprocesses. The

19. Giovanni Sartori, "Concept Misformation in Comparative Politics," *American Political Science Review*, Vol. 64, No. 4 (December 1970), pp. 853–864; and David Collier and Steven Levitsky, "Democracy With Adjectives: Concept Innovation in Comparative Research," *World Politics*, Vol. 49, No. 3 (April 1997), pp. 430–451.

method of process-tracing does not necessarily focus on the individual decision-making level of analysis.

Forms of Causal Processes

The process-tracing technique must be adapted to the nature of the causal process thought to characterize the phenomenon being investigated. Several different types of causal processes can be distinguished.[20] The simplest form is linear causality, a straightforward, direct chain of events that characterizes simple phenomena. However, many or most phenomena of interest in international relations and comparative politics are characterized by more complex causality, for which the assumption of linearity is misplaced.

In a more complex form of causality the outcome flows from the *convergence* of several conditions, independent variables, or causal chains. An example of this type of complex explanation occurs in Theda Skocpol's study of revolutions referred to in Chapter 8.

A still more complex form involves *interacting* causal variables that are not independent of each other. Case study methods provide opportunities for inductively identifying complex interaction effects. In addition, typological theories (discussed in Chapter 11) can capture and represent interaction effects particularly well. Statistical methods can also capture interaction effects, but they are usually limited to interactions that reflect simple and well-known mathematical forms.

Another type of causal process to which the technique of process-tracing can be applied occurs in cases that consist of a sequence of events, some of which foreclose certain paths in the development and steer the outcome in other directions. Such processes are *path-dependent*. A different kind of within-case analysis and process-tracing is needed for dealing with phenomena of this kind. The investigator must recognize the possibility of path dependency in order to construct a valid explanation. Path dependency can be dealt with in several ways, for example by identifying key decision points or branching points in a longitudinal case (as in Jack Levy's study of developments during the six-week crisis that led to World War I and in Brent Sterling's study of policy choices during limited wars).[21] However, the investigator must avoid assuming that certain outcomes were necessarily excluded once and for all by the resolution of an earlier branching point. One or another final outcome may have become only less likely at that stage, but the way in which subsequent branching points were resolved may have increased its probability.

Such considerations are particularly relevant when the branching points are decisions taken by policymakers. A decision taken at one point that reduces the likelihood of achieving a desired policy goal may be recouped by changes in the situation that give policymakers a second chance to accomplish a desired goal or to avoid a poor outcome. In brief, path dependency at early points in the development of a longitudinal case should not be assumed to determine the outcome. Process-tracing can assess to what extent and how possible outcomes of a case were restricted by the choices made at decision points along the way. Assessments of this kind may be facilitated by counterfactual analysis.

Perhaps enough has been said to emphasize and illustrate that there are a number of distinctively different types of process-tracing just as there are different types of causal processes. *The challenge in using process-tracing is to choose a variant of it that fits the nature of the causal process embedded in the phenomenon being investigated.*

Uses of Process-Tracing

Case studies are useful, as Harry Eckstein and Arend Lijphart noted many years ago, at all stages in the formation, development, and testing of theories.[22] Moreover, deductive theories (including rational choice theories) and empirical theories derived inductively can be employed using one or another type of process-tracing. Those who cite Achen and Snidal's critique of existing case studies of deterrence often overlook the

20. For a similar discussion of different types of causal relations, see Robert Jervis, *System Effects: Complexity in Political and Social Life* (Princeton, N.J.: Princeton University Press, 1997), pp. 34–60.

21. Levy ("The Role of Crisis Management in the Outbreak of World War I") and Sterling ("Policy Choice During Limited War") articles.

22. Both Eckstein and Lijphart offer typologies of case studies; their terminology differs but the types they identify are similar with two exceptions. Lijphart does not designate a category for Eckstein's "plausibility probe," and he adds the quite important "deviant case" for which Eckstein does not make explicit provision. The similarities and differences between their listings of types of cases are as follows:

Lijphart	*Eckstein*
"atheoretical case study"	"configurative-ideographic"
"interpretative case study"	"disciplined-configurative"
"hypothesis-generating case study"	"heuristic"
(?)	"plausibility probe"
"theory-confirming case study"	"crucial case" and "tough tests"
"theory-infirming case study"	
"deviant case study"	(?)

authors' emphasis on the critical importance of case studies for theory development and testing:

> Although many of our comments have criticized how case studies are used in practice, we emphatically believe they are essential to the development and testing of social science theory. . . . In international relations, only case studies provide the intensive empirical analysis that can find previously unnoticed causal factors and historical patterns. . . . The [case study] analyst is able to identify plausible causal variables, a task essential to theory construction and testing. . . . Indeed, analytic theory cannot do without case studies. Because they are simultaneously sensitive to data and theory, case studies are more useful for these purposes than any other methodological tool.[23]

The study of macro- as well as microlevel phenomena benefits from uses of process-tracing. The utility of process-tracing is not restricted to the study of the intentional behavior of actors and organizations; it is also applicable, as in Theda Skocpol's study of *States and Revolution*, to investigations of any hypothesized causal process. An interest in studying process is to be seen also in the use of simulations, as in the recent work of Bruce Bueno de Mesquita and Frans Stokman.[24] And, as is increasingly clear, process-tracing is particularly important for generating and assessing evidence on causal mechanisms.[25]

More generally, process-tracing offers an alternative way for making causal inferences when it is not possible to do so through the method of controlled comparison. In fact, process-tracing can serve to make up for the limitations of a particular controlled comparison. When it is not possible to find cases similar in every respect but one—the basic requirement of controlled comparisons—one or more of the *several* independent variables identified may have causal impact. Process-tracing can help to assess whether each of the potential causal variables in the imperfectly matched cases can, or cannot, be ruled out as having causal significance. If all but one of the independent variables that differ between the two

23. Christopher H. Achen and Duncan Snidal, "Rational Deterrence Theory and Comparative Case Studies," *World Politics*, Vol. 41, No. 2 (January 1989), pp. 167–168.

24. Bruce Bueno de Mesquita and Frans N. Stokman, eds., *European Community Decision Making: Models, Applications, and Comparisons* (New Haven, Conn.: Yale University Press, 1994).

25. Scientific realists who have emphasized that explanation requires not merely correlational data, but also knowledge of intervening causal mechanisms, have not yet had much to say on methods for generating such knowledge. The method of process-tracing is relevant for generating and analyzing data on the causal mechanisms, or processes, events, actions, expectations, and other intervening variables, that link putative causes to observed effects.

cases can be ruled out via a process-tracing procedure that finds no evidence that they were operating in the two cases, a stronger (though still not definitive) basis exists for attributing causal significance to the remaining variable. The case for it is strengthened, of course, if process-tracing uncovers evidence of the role of that variable in the process leading to the outcome.[26]

In the same way, process-tracing can ameliorate the limitations of John Stuart Mill's methods of agreement and difference. For example, process-tracing offers a way of assessing *hypotheses* regarding causal relations suggested by preliminary use of Mill's methods, as in Theda Skocpol's study.[27] More generally, process-tracing can identify single *or different* paths to an outcome, point out variables that were otherwise left out in the initial comparison of cases, check for spuriousness, and permit causal inference on the basis of a few cases or even a single case. These potential contributions of process-tracing make case studies worthwhile even when sufficient cases exist for use of statistical methods.

Process-tracing may be a unique tool for discovering whether the phenomenon being investigated is characterized by equifinality (or "multiple convergence" as it is referred to by some scholars). Process-tracing offers the possibility of identifying different causal paths that lead to a similar outcome in different cases. These cases, in turn, can serve as building blocks for empirical, inductive construction of a typological theory.[28] Process-tracing encourages the investigator to be sensitive to the possibility of equifinality. Case studies employing process-tracing are particularly useful as a supplement in large-N statistical analyses, which are likely to overlook the possibility of equifinality and settle for a statement of a probabilistic finding regarding only one causal path at work.

Process-tracing is particularly useful for obtaining an explanation for deviant cases, those that have outcomes not predicted or explained adequately by existing theories. Deviant cases are frequently encountered in large-N studies and usually noted as such without an effort to explain why they are deviant. Process-tracing of deviant cases offers an opportunity to differentiate and enrich the general theory. Witness, for example, the exemplary study of the International Typographical Union (I.T.U.) by

26. See James Lee Ray, *Democracies and International Conflict: An Evaluation of the Democratic Peace Proposition* (Columbia: University of South Carolina Press, 1995), pp. 158–200.

27. For discussion, see Chapter 8.

28. For a detailed discussion of equifinality and typological theory, see Chapters 8 and 11.

Seymour Martin Lipset, Martin Trow, and James S. Coleman. They noted that the record of the I.T.U. contradicted the "iron law of oligarchy" advanced by Robert Michels in his classic study, *Political Parties,* which argued that inherent in any large-scale social organization were motivations and means that led leaders of its bureaucratic structure to place protection and exercise of their position ahead of commitment to democratic internal procedures. Contradicting the generalization, the I.T.U. governed itself through an elaborate and largely effective democratic system. The I.T.U., as Lipset describes it in a subsequent "biography" of their study, was an example of what he later learned that Paul Lazarsfeld called a deviant case. The authors' study of the I.T.U. investigated whether there were new or specific factors present in this deviant case that explained its departure from the iron law of oligarchy. A historical-structural study of the I.T.U. employing survey research data and making some use of process-tracing uncovered causal mechanisms and social and psychological processes that provided an explanation for the special deviant character of the union.[29]

The identification and analysis of deviant cases and of cases characterized by equifinality are useful for developing *contingent generalizations* that identify the conditions under which alternative outcomes occur. The importance of developing conditional generalizations of limited scope, a form of middle-range theory, is emphasized at various points in the present study.[30]

In developing a theory about a particular phenomenon such as deterrence via analytic induction, as in the Alexander George and Richard Smoke study (summarized in the Appendix, "Studies That Illustrate Research Design"), process-tracing provided an explanation for each of the small number of cases examined. At the outset, each case was regarded as a possible deviant case. When explanations for the outcome of individual cases vary, the results can be cumulated and contribute to the development of a rich, differentiated theory about that phenomenon.

29. Seymour M. Lipset, Martin Trow, and James S. Coleman, *Union Democracy* (Glencoe, Ill.: Free Press, 1956). Lipset later provided a remarkably interesting account of the origins and development of the study in "The Biography of a Research Project: Union Democracy," in Philip E. Hammond, ed., *Sociologists at Work,* (New York: Doubleday Anchor Books, 1967), pp. 111–139.

Another example of deviant case analysis is illustrated in Lijphart's *Politics of Accommodation,* summarized in the Appendix. Stephen Van Evera emphasizes the importance of studying deviant cases, which he refers to as "outlier" cases, for theory development. See Stephen Van Evera, *Guide to Methods for Students of Political Science* (Ithaca, N.Y.: Cornell University Press, 1997), pp. 22–23, 69.

30. See, for example, Chapter 12.

Assessing Predictions

If a theory is sufficiently developed that it generates or implies predictions about causal processes that lead to outcomes, then process-tracing can assess the predictions of the theory. In this use, process-tracing evidence tests whether the observed processes among variables in a case match those predicted or implied by the theory. To be sure, as noted earlier in this chapter, many available theories have not been developed to the point that they are capable of making predictions about causal processes. Under these circumstances, process-tracing of cases relevant to the theory can identify causal processes not yet identified by the theory. In this way, process-tracing contributes not to the *testing* of the theory, but to its further *development.*

Assessing Alternative Hypothesized Processes

We note in particular that process-tracing needs to consider the possibility of alternative processes that lead to the outcome in question. It is important to examine the process-tracing evidence not only on the hypothesis of interest, but on alternative hypotheses that other scholars, policy experts, and historians have proposed. Too often, researchers focus great attention on the process-tracing evidence on the hypothesis that interests them most, while giving the process-tracing evidence that bears on alternative explanations little attention or using it only to explain variance that is not adequately explained by the hypothesis of interest. This can create a strong confirmation bias, and it can overstate the causal weight that should be accorded to the hypothesis of interest.

Lawrence Mohr has given a useful account of the need to avoid confirmation bias, following Michael Scriven's *modus operandi* method and his metaphor of a detective:

> . . . when X causes Y it may operate so as to leave a "signature," or traces of itself that are diagnostic. In other words, one can tell when it was X that caused Y because certain other things that happened and are observed unequivocally point to X. At the same time, one knows the signature of other possible causes of Y and one may observe that those traces did *not* occur. By using this technique, one can make a strong inference that X either did or did not cause Y in a certain case. For the present purpose, moreover, one notes in passing the affinity of this approach for the study of a single case. The kind of example of the *modus operandi* approach that is frequently given reminds one of the work of a detective or a diagnostician.[31]

31. Lawrence B. Mohr, "The Reliability of the Case Study as a Source of Informa-

Yet as Mohr himself points out, the theory in question may not leave an observable signature. It is also possible that the predictions about causal process attributed to, or claimed by, the theory may be questionable or ambiguous. Moreover, proving the negative and demonstrating that a particular process did not occur can be notoriously difficult. Both detectives and researchers face these difficulties. But the main difficulty may be that the theory is not sufficiently specified to allow one to identify confidently a causal process it predicts or is capable of predicting.

As Mohr's detective metaphor suggests, when well-specified theories are available, process testing can proceed forward, from potential causes to effects; backward, from effects to their possible causes; or both. The use of process-tracing to verify the predictions of a theory should also ordinarily involve attempts to test and eliminate alternative causal processes (derived from other theories) that might lead to the same outcome. For example, the detective usually pursues several suspects and clues, constructing possible chronologies and causal paths backward from the crime scene and forward from the last known whereabouts of the suspects. With theories, as with suspects, the evidence might not be sufficient to eliminate all but one. In addition, alternative theories and the causal processes they specify may be complementary rather than mutually exclusive. Since more than one theory may be consistent with the process-tracing evidence, several may have contributed to the observed effect or even overdetermined it.

On the other hand, when theories make genuinely competing process predictions, the process-tracing evidence may be incomplete in ways that do not permit firm conclusions on which theory fits better. The detective's colleague, the district attorney, would remind us that a potential causal path cannot explain a case if it does not establish an uninterrupted causal path from the alleged cause to the observed outcome. The inaccessibility of evidence at one point in this path does not disprove the cause, but does make it harder to eliminate competing theories beyond a reasonable doubt.

ASSESSING THE CAUSAL POWER OF AN INDEPENDENT VARIABLE

Most case studies are outcome-oriented; they focus on explaining variance in the dependent variable. But when researchers or policymakers

tion," in Robert F. Coulam and Richard A. Smith, eds., *Advances in Information Processing in Organizations*, Vol. 2 (Greenwich, Conn.: JAI Press Inc., 1985), pp. 65–97. The quote is from pp. 82–83. Mohr cites Michael Scriven, "Maximizing the Power of Causal Investigations: The Modus Operandi Method," in Gene V. Glass, ed., *Evaluation Studies Review Annual*, Vol. 1 (Beverly Hills, Calif.: Sage, 1976), pp. 101–118.

wish to assess the causal power of a particular factor—such as an independent variable that policymakers can manipulate—they have an interest in exploring the contingent conditions under which similarity or variance in the independent variable leads to different outcomes.[32] Research on the strategy of coercive diplomacy, for example, treats it as an independent variable and develops a typology of such strategies to investigate variations in outcome of these strategies.

We differ with many methodologists in that we argue that a theory can be derived or modified based on the evidence within a case, and still be tested against *new facts* or *new evidence* within the same case, as well as against other cases. Detectives do this all the time—clues lead them to develop a new theory about a case, which leads them to expect some evidence that in the absence of the new theory would have been wildly unexpected, and the corroboration of this evidence is seen as strong confirmation of the theory.

This process relies on Bayesian logic—the more unique and unexpected the new evidence, the greater its corroborative power. For example, in *The Limits of Safety*, Scott Sagan made process-tracing predictions on particular kinds of evidence regarding nuclear accidents that would be true if his theory were true, but that would have been highly unlikely if the alternative explanations were true.[33] Another example comes from research on schizophrenia. When researchers looking at brain chemistry proposed a chemical mechanism that might help explain schizophrenia, they unexpectedly found that this same chemical mechanism was involved in the brain's reaction to the inhalation of cigarette smoke. The proposed mechanism thus appeared to explain the long-known but unexplained fact that some schizophrenics tend to be chain-smokers. In other words, schizophrenics may have unconsciously been using chain-smoking to ameliorate the brain chemistry abnormalities that caused their schizophrenia. As the researchers were not looking for or expecting an explanation of schizophrenic's chain-smoking, this finding is a heuristically independent confirmation. Although the study involved many schizophrenics, the logic of this kind of confirmation does not derive

32. Here, we can use process-tracing inductively. It may even be possible to study all known cases in which a variable assumed a certain value, if the number of such cases is manageably small. If the number of cases is large, then the researcher may choose to narrow the context to cases in a particular country or time period, or he may choose cases in ways that achieve a specified range of values or variables that interact with the manipulable variable of interest.

33. Scott D. Sagan, *The Limits of Safety: Organization, Accidents, and Nuclear Weapons* (Princeton, N.J.: Princeton University Press, 1993).

from sample size and it applies in single cases of the kind that historians often investigate.[34]

VALIDITY OF CONCLUSIONS BASED ON SINGLE CASE STUDIES

Some political scientists argue that causal explanation *requires* case comparisons and that single-case studies have limited uses in theory building. James Lee Ray, for example, has argued that causal linkages cannot be identified within the context of one case.[35] Similarly, the authors of *Designing Social Inquiry* (*DSI*) argue that the single observation is not a useful technique for testing hypotheses or theories unless it can be compared to other observations by other researchers. They add that single cases cannot exclude alternative theories, and that their findings are limited by the possibility of measurement error, probabilistic causal mechanisms, and omitted variables.[36]

Indeed, the conclusions of single case studies are much stronger if they can be compared to other studies, but we suspect that most historians would join us in arguing that the limitations attributed to single case studies are not categorical. As *DSI* acknowledges, its view of the limits of single case studies is based in part on its definition of a case having only one observation on the dependent variable, and it notes that "since one case may actually contain many potential observations, pessimism is actually unjustified." Thus, while process-tracing may not be able to exclude all but one of the alternative theories in a single case, if some competing theories make similar process-tracing predictions, many single case studies can exclude at least some explanations. Process-tracing in single cases, for example, has the capacity for disproving claims that a single variable is necessary or sufficient for an outcome. Process-tracing in a single case can even exclude all explanations but one, if that explanation makes a process-tracing prediction that all other theories predict would be unlikely or even impossible.

As for measurement error, case study research is less prone to some kinds of measurement error because it can intensively assess a few variables along several qualitative dimensions, rather than having to quantify variables across many cases. Similarly, probabilistic causal mechanisms and the potential for omitted variables pose difficult challenges and limits to all research methods, but they do not necessarily invalidate

34. Denise Grady, "Brain-Tied Gene Defect May Explain Why Schizophrenics Hear Voices," *New York Times*, January 21, 1997, p. C–3.

35. Ray, *Democracy and International Conflict*, p. 132.

36. Gary King, Robert O. Keohane, and Sidney Verba, *Designing Social Inquiry: Scientific Inference in Qualitative Research* (Princeton, N.J.: Princeton University Press, 1994), pp. 208, 210–211.

the use of single case studies. The inductive side of process-tracing may identify potential omitted variables through the intensive study of a few cases, and single case studies have changed entire research programs when they have impugned theories that failed to explain their most-likely cases.[37]

In before-after research designs, discussed in Chapter 8, the investigator can use process-tracing to focus on whether the variable of interest was causally linked to any change in outcome and to assess whether other independent variables that change over time might have been causal. In Donald Campbell's and Julian Stanley's terms, the potential confounding variables of greatest interest in a before-after design are maturation effects (the effects of a unit maturing from one developmental stage to another) and the effects of history (exogenous changes over time).[38] For example, in Andrew Bennett's comparison of the Soviet decision to intervene in Afghanistan in 1979 to the Soviet withdrawal from that country in 1989, he needed to look at several variables that had changed in the intervening decade. In particular, it was essential to use process-tracing to assess the respective roles of changes in Soviet leaders' views on the use of force, changes in the Soviet government (such as Mikhail Gorbachev's political reforms), and changes in Soviet interactions with other actors (such as the emergence of a U.S. policy of providing aid to the Afghan rebels). Process-tracing evidence in this study indicated that U.S. aid to Afghan rebels likely delayed a Soviet withdrawal, but made a more complete withdrawal more likely. Soviet democratization had little effect because it largely took place after 1989, and changes in Soviet ideas fit both the specifics and timing of the Soviet withdrawal and associated Soviet policies.[39]

We have emphasized the use of process-tracing to develop and refine many theories that are not yet capable of generating testable predictions about causal processes and outcomes. Such a procedure need not degenerate into an atheoretical and idiosyncratic enterprise. When a researcher uncovers a potential causal path for which there is no pre-existing theory, there are several possible approaches for converting this atheoretical finding into an analytical result couched in terms of theoretical variables. For example, deductive logic or study of other cases may suggest a gen-

37. This point is emphasized by Ronald Rogowski, "The Role of Theory and Anomaly in Social Scientific Inference," *American Political Science Review*, Vol. 89, No. 2 (June 1995), p. 467.

38. See Donald T. Campbell and Julian C. Stanley, *Experimental and Quasi-Experimental Designs for Research* (Chicago: Rand McNally College Publishing, 1973).

39. Andrew Bennett, *Condemned to Repetition? The Rise, Fall, and Reprise of Soviet-Russian Military Intervention, 1973–1996* (Cambridge, Mass.: MIT Press, 1999).

eralizable theory that includes the novel causal path. If so, it may be possible to specify and operationalize that new theory and assess it by means of a plausibility probe involving other cases. Or the novel causal path may be identified as an exemplar of an existing theory that the investigator had overlooked or had thought to be irrelevant. The newly identified causal process may then contribute to the evaluation of the existing theory. Finally, it is possible that the novel causal path may have to remain ungeneralizable and unconnected to a useful theory for the time being.

The Limits of Process-Tracing

There are two key constraints on process-tracing. Process-tracing provides a strong basis for causal inference only if it can establish an uninterrupted causal path linking the putative causes to the observed effects, at the appropriate level(s) of analysis as specified by the theory being tested. Evidence that a single necessary intervening variable along this path was contrary to expectations strongly impugns any hypothesis whose causal effects rely on that causal path alone. The inferential and explanatory value of a causal path is weakened, though not negated, if the evidence on whether a certain step in the putative causal path conformed to expectations is simply unobtainable. Also, theories frequently do not make specific predictions on all of the steps in a causal process, particularly for complex phenomena. When data is unavailable or theories are indeterminate, process-tracing can reach only provisional conclusions.

Another potential problem for process-tracing is that there may be more than one hypothesized causal mechanism consistent with any given set of process-tracing evidence. The researcher then faces the difficult challenge of assessing whether alternative explanations are complementary in the case, or whether one is causal and the other spurious. Even if it is not possible to exclude all but one explanation for a case, it may be possible to exclude at least some explanations and thereby to draw inferences that are useful for theory-building or policymaking.

Olav Njølstad has emphasized this problem in case study research, noting that differing interpretations may arise for several reasons. First, competing explanations or interpretations could be equally consistent with the available process-tracing evidence, making it hard to determine whether both are at play and the outcome is overdetermined, whether the variables in competing explanations have a cumulative effect, or whether one variable is causal and the other spurious. Second, competing explanations may address different aspects of a case, and they may not be commensurate. Third, studies may be competing and commensurate, and they may simply disagree on the facts of the case.

Njølstad offers several useful suggestions on these problems, although we disagree with his suggestion that these are substantially different from the standard methodological advice offered in discussion in Chapter 3. These suggestions include: identifying and addressing factual errors, disagreements, and misunderstandings; identifying all potentially relevant theoretical variables and hypotheses; comparing various case studies of the same events that employ different theoretical perspectives (analogous to careful attention to all the alternative hypotheses in a single case study); identifying additional testable and observable implications of competing interpretations of a single case; and identifying the scope conditions for explanations of a case or category of cases.[40]

Summary on Process-Tracing

Process-tracing provides a common middle ground for historians interested in historical explanation and political scientists and other social scientists who are sensitive to the complexities of historical events but are more interested in theorizing about categories of cases as well as explaining individual cases. We do not regard process-tracing as a panacea for theory testing or theory development. It can require enormous amounts of information, and it is weakened when data is not accessible on key steps in a hypothesized process. In a particular case, limited data or underspecified theories (or both) may make it impossible to eliminate plausible alternative processes that fit the available evidence equally well. Both false positives, or processes that appear to fit the evidence even though they are not causal in the case at hand, and false negatives, processes that are causal but do not appear to be so, are still possible through measurement error or under-specified or misspecified theories.

Process-tracing has many advantages for theory development and theory testing, however, some of them unique. It is a useful method for generating and analyzing data on causal mechanisms. It can check for spuriousness and permit causal inference on the basis of a few cases or even a single case. It can greatly reduce the risks of the many potential inferential errors that could arise from the isolated use of Mill's methods of comparison, congruence testing, or other methods that rely on studying covariation. It can point out variables that were otherwise left out in the initial model or comparison of cases, and it can lead inductively to the explanation of deviant cases and the subsequent derivation of new hypotheses.

Process-tracing is particularly useful at addressing the problem of

40. Olav Njølstad, "Learning from History? Case Studies and the Limits to Theory-Building," in Nils Petter Gleditsch and Olav Njølstad, eds., *Arms Races: Technologies and Political Dynamics* (Newbury Park, Calif.: Sage, 1989), pp. 240–244.

equifinality by documenting alternative causal paths to the same outcomes and alternative outcomes for the same causal factor. In this way, it can contribute directly to the development of differentiated typological theories. Finally and most generally, process-tracing is the only observational means of moving beyond covariation alone as a source of causal inference. Whether it is pursued through case studies, correlations, experiments, or quasi-experiments, it is an invaluable method that should be included in every researcher's repertoire. It can contribute in ways that statistical methods can do only with great difficulty, and it is often worthwhile even when sufficient cases exist for the concurrent use of statistical methods. The power of process-tracing for both theory testing and heuristic development of new hypotheses accounts in part for the recent "historical turn" in the social sciences and the renewed interest in path-dependent historical processes.

However, we do not regard the within-case methods such as process-tracing as competitive with case comparisons or statistical analysis; rather, both within-case and cross-case analyses are important for advancing theory testing and theory development. The two methods provide different and complementary bases for causal inference. Case studies are superior at process-tracing, which relates to the causal mechanism component of causal explanation. Statistical studies are better at measuring the observed probability distribution relating measures of an independent variable to measures of outcomes across a large number of cases, which relates to the component of causal explanation defined as causal effects.[41] More attention needs to be given to developing ways in which researchers working with each method can complement one another in well-designed research programs, because it is seldom possible for a single researcher to apply both methods with a high level of proficiency. We turn now to a discussion of the logic of historical explanation.

Process-Tracing and Historical Explanation: Similarities and Differences

The question is sometimes asked whether process-tracing is similar to historical explanation and whether process-tracing is anything more than "good historical explanation." It is not unreasonable to respond to such

41. For a formal definition of causal effects, see Keohane, King, and Verba, *Designing Social Inquiry*, pp. 76–82. For an illustration of how case studies and statistical studies contribute complementary kinds of knowledge to a research program, see Chapters 1 and 2 and Andrew Bennett and Alexander L. George, "An Alliance of Statistical and Case Study Methods: Research on the Interdemocratic Peace," *Newsletter of the APSA Organized Section in Comparative Politics*, Vol. 9, No. 1 (Winter 1998), pp. 6–9.

an observation by asking what is a good historical explanation! We indicated earlier in this chapter how a process-tracing explanation differs from a historical narrative, and emphasized the desirability for certain research purposes of converting a purely historical account that implies or asserts a causal sequence into an analytical explanation couched in theoretical variables that have been identified in the research design. Some historians object that converting a rich historical explanation into an analytical one may lose important characteristics or the "uniqueness" of the case. This is true, and information loss does occur when this is done, and the investigator should be aware of this and consider the implications for his or her study of the fact that some of the richness and uniqueness of the case is thereby lost. But ultimately we justify the practice of converting historical explanations into analytical theoretical ones by emphasizing that the task of the political scientist who engages in historical case studies for theory development is not the same as the task of the historian.

Nonetheless, understanding of the nature and logic of historical explanation is essential for making effective use of the process-tracing method. The requirements, standards, and indeed the logic of historical explanation have long been discussed and debated by philosophers of history, and the important disagreements and controversies of this literature are pertinent to process-tracing, even though we cannot and need not resolve them.

We have found Clayton Roberts' book, *The Logic of Historical Explanation*, particularly useful.[42] Roberts offers a detailed statement of his own position that is, on the whole, remarkably consistent with our concept of process-tracing. Roberts rejects, as do we, the view advanced in the past by some commentators that historical explanation is no more than—and requires no more than—a description of a sequence of events. In principle, he holds, each step or link of a causal process should be supported by an appropriate "law," defined for historical explanation by Carl Hempel as a statement of a regularity between a set of events. Roberts distinguishes, however, between universalistic and probabilistic laws. While the Hempelian "covering law" model is deductive in form, it is clear that no explanation using probabilistic laws can be strictly deductive. Moreover, the covering law model cannot explain, Ernest Nagel observed, "collective events that are appreciably complex."[43] Given this problem, Roberts observes, "historians rarely seek to explain the occurrence of a

42. Clayton Roberts, *The Logic of Historical Explanation* (University Park: Pennsylvania State University Press, 1996).

43. Ernest Nagel, *The Structure of Science: Problems in the Logic of Scientific Explanation* (New York: Harcourt, Brace and World, 1961), p. 574.

complex event by subsuming it solely under a covering law," a process that he calls "macrocorrelation." Attempts to rely on macrocorrelation to explain complex events have failed: "The vast majority of historians do not use macrocorrelation to explain the occurrence of events they are studying, and those who do have met with little success."[44]

How, then, Roberts asks, do historians explain the occurrence of complex historical events if not by subsuming them under covering laws? Roberts argues that they do so "by tracing the sequence of events that brought them about." The similarity to what we call "process-tracing" is clear. Roberts notes that a number of earlier writers have made the same point, referring to process-tracing variously as "a genetic explanation" (Ernest Nagel), "a sequential explanation" (Louis Mink), "the model of the continuous series" (William Dray), "a chain of causal explanations" (Michael Scriven), "narrative explanations" (R. F. Atkinson), and "the structure of a narrative explanation" (Arthur Danto). Roberts chooses to call this explanatory process "colligation," drawing on earlier usages of this term and clarifying its meaning.[45]

Roberts' contribution is to explicate better than earlier writers the logic of such historical explanations. Laws that embody but are no more than "regularities" and "correlations," he argues, are not adequate explanations. A mere statement of a correlation, such as that between smoking and cancer, may have some explanatory power, but it is incomplete and unsatisfactory unless the causal relation or connection between the two terms is specified. He notes that historians and philosophers have given many names to such causal connections. (Later, Roberts refers approvingly to the recent philosophy of scientific realism and its emphasis on the need to identify causal mechanisms.)

Given that a correlation is not a substitute for investigating causation, how then can one determine whether some correlations are causal and others are not? Roberts asserts (as others, including ourselves, do) that it is only through colligation (process-tracing) that this can be done. He notes that historians, like geologists, often rely on process explanations to answer the question, "What has happened [to bring this about]?"

Roberts regards efforts to explain *complex* events solely by invoking a

44. Roberts, *The Logic of Historical Explanation*, pp. 9, 15.

45. Ibid., p. 20. Roberts notes that "colligation" has also been used by some writers to refer to "the grouping of events under appropriate conceptions." By this he evidently means subsuming single instances of a given type of phenomenon (e.g., revolution, deterrence) under a class of such events. Roberts prefers to refer to this second meaning of colligation as "classification" and drops it from his preferred definition of colligation. This point is worth noting here since use of case studies for theory development, as in structured, focused comparison, is based on studying one or several cases, each of which is an instance of a class of events.

covering law insupportable for two reasons: it is rarely possible to formulate general covering laws for this purpose, and reliance solely on them foregoes the necessary process-tracing of the sequence in the causal chain. Each step in such a causal sequence, Roberts holds, should be supported with an appropriate, though necessarily circumscribed, covering law. He labels this the practice of "microcorrelation" to distinguish it from efforts at "macrocorrelation" to explain complex events. As Roberts puts it, microcorrelation "is the minute tracing of the explanatory narrative to the point where the events to be explained are microscopic and the covering laws correspondingly more certain."[46]

We offer an example that illustrates the difference between "macrocorrelation" and "microcorrelation" and depicts reliance on microcorrelation for explaining a complex phenomenon. In *States and Social Revolutions*, Theda Skocpol wanted to provide a causal explanation for three social revolutions (the French, Russian, and Chinese revolutions). She identified and worked with two independent variables: international pressures on the state and peasant rebellion. To show how these two variables were causally related to the revolutionary social transformation in each of these countries, Skocpol employed a complex form of microcorrelation.[47] She used the process-tracing procedure to identify a complex sequence of events to depict how each of the two independent variables set into motion a complex causal chain. She also showed how the two causal sequences came together to trigger a revolutionary social transformation in each country. The procedure she employed for tracing each step (or link) in the causal chain was supported by combining Mill's methods with micro process-tracing. That is, Skocpol did not attempt to support the causal relationship between the two independent variables and the outcome of the dependent variable by means of macrotype covering laws; she identified a sequence of several steps or links between each independent variable and the outcome, supporting each by a form of micro process-tracing.[48]

46. Ibid., p. 66. Roberts' discussion of microcorrelation is less clear than in the statement quoted here.

47. This type of complex theory is referred to by Abraham Kaplan as "concatenated theory." See Kaplan, *Conduct of Inquiry* (San Francisco, Calif.: Chandler, 1964), p. 298: "A *concatenated* theory is one whose component laws enter into a network of relations so as to constitute an identifiable configuration or pattern. Most typically, they converge on some central point, each specifying one of the factors which okays a part in the phenomenon which the theory is to explain."

48. Our construction of Skocpol's analysis is provisional and subject to reconsideration. A somewhat different construction of the analytical structure of Skocpol's study is suggested by James Mahoney (personal communication). Skocpol's study has generated a great deal of critical comment, much of it questioning her reliance on Mill's

Roberts recognizes that some explanations—particularly those supported by probabilistic laws—will be weak, and he discusses various strategies historians employ to develop stronger explanations. Of particular interest is "redescription," which describes the event to be explained in a less concrete, more abstract manner. Doing so may enable the investigator to use a credible covering law. This is similar to the practice in political science research of moving up the ladder of generality in formulating concepts.[49] A similar practice is frequently employed in statistical studies—"cell reduction" being a way of obtaining enough cases in a broader cell to permit statistical analysis. The new, larger cell necessarily requires a less concrete, more abstract label than the concepts attached to the old, smaller cells.

Roberts is particularly supportive of another strategy for strengthening weak explanations. "Microcorrelation," to which he referred earlier as noted above, strengthens an explanation via "the minute tracing of the explanatory narrative to the point where the events to be explained are microscopic and the covering laws correspondingly more certain." At the same time, Roberts recognizes that "the more microscopic the event to be explained, the more likely that the covering law will be a platitude . . . or a truism."[50]

Implicit in Roberts' disquisition is a rejection of the widespread belief that historians do *not* make use of covering laws. He attributes this misconception to the fact that most of the laws historians make use of are not only "parochial" but also are not generally visible in their historical narratives. Such laws are not visible because they are generally implicit in the explanatory accounts historians provide. Roberts defends this practice on the ground that many of the covering laws are "platitudinous," and therefore it would be tedious continually to list them and to assert their validity. Besides, these covering laws are so numerous in historical narratives that to list and justify them "would hopelessly clog the narrative."

Roberts recognizes that historians have an obligation to make sure

methods. However, as Jack Goldstone has pointed out in one of the most discerning and balanced of the evaluations of her study, Skocpol supplemented use of Mill's methods with considerable use of process-tracing, a fact that she did not clearly convey. Compare Jack Goldstone, "Methodological Issues in Comparative Macrosociology" (forthcoming); see also Goldstone, "Revolution, War, and Security" (manuscript, 1997).

49. This calls to mind, of course, Giovanni Sartori's well-known metaphor of "moving up and down a ladder of generality." See Sartori's seminal article, "Concept Misformation in Comparative Politics."

50. Roberts, *The Logic of Historical Explanation*, pp. 66–67.

that the implicit covering laws they employ are true. But he does not address the question of how this can be or is done, contenting himself with the observation that "reviewers and perceptive readers" can readily tell the difference between histories based on sound covering laws and those that are naïve and superficial." He adds that historians will occasionally make their supportive generalizations explicit, particularly when a controversy arises among historians over the truth of an explanation.[51]

In theory-based process-tracing, on the other hand, it is not desirable to rest explanations on implicit laws. Besides, the method of structured, focused comparison and process-tracing are employed not only in studies that attempt to provide explanations for specific cases but also to test and refine available theories and hypotheses, to develop new theories, and to produce generic knowledge of a given phenomenon. Given this theory development objective, it is all the more necessary to couch explanations in terms of theoretical variables and causal hypotheses.

In Chapter 6 on "The Logic of Colligation," Roberts distinguishes eight different forms that process-tracing may take. Several of these are of interest for the present study. The simplest form of process-tracing, linear colligation, depicts "a straightforward chain of events," which is often a naïve simplification of a complex phenomenon. Convergent colligation, on the other hand, depicts the outcome to be explained as flowing from the convergence of several conditions, independent variables, or causal chains. Skocpol's study, discussed above, is an example of convergent colligation, showing how two processes set into motion, one by international pressures causing state breakdown and the other by peasant rebellions, converged to cause revolutionary social movements.

Another type of process-tracing, repetitive colligation, provides the basis for Roberts' consideration of the relation of history to theory and science.[52] Whereas history often limits itself to searching for the cause of a single event, "the purpose of science is to discover the laws governing the behavior of a phenomenon," although laws of a correlational nature are used in the covering-law model of explanation. "To explain why a law exists, why a correlation occurs, one needs a theory," one which contains "a model that shows how the system works, the system that gives rise to the uniformities observed." It appears, here, that Roberts is alluding to what others have referred to as "causal mechanisms."

Roberts notes that the corpus of historical writing contains few theories, the reason being that historians have been unable to find any general laws that stood the test of time. The implicit assumption he makes here,

51. Ibid., pp. 87–88.

52. Ibid., pp. 145–159.

which may be questioned, is that absent "general laws," formulation of theory is not possible. In fact, as we emphasize throughout the book, researchers can develop middle-range theories comprising conditional generalizations and typological theories. The general failure of the social sciences (with the partial exception of economics) to find meaningful laws, Roberts observed, has led Jon Elster to conclude that "the basic concept in the social sciences should be that of a mechanism rather than of a theory." Roberts takes Elster's observations as consistent with his own concept of historical explanation as being "a marriage of colligation [process-tracing] and correlation."[53]

THE ROLE OF COUNTERFACTUAL ANALYSIS IN HISTORICAL EXPLANATION

We discussed some important requirements of effective use of counterfactuals in Chapter 8. Resort to counterfactual analysis is indeed a common practice in many different types of research. Mental experiments in the service of theory development have a long and often distinguished history.[54] Some writers have argued that, implicitly if not explicitly, all explanation and hypothesis testing require employment of counterfactual analysis or would benefit from it.

Here we add to the earlier discussion of counterfactuals by considering whether the within-case method employing process-tracing must be supported with counterfactual analysis. If it does, then the question arises whether the within-case method can be regarded as an alternative to controlled comparison and its use of experimental logic.

One may recognize that in principle any historical explanation implies a counterfactual in the sense that the historical outcome would not have occurred had the causal variables adduced in support of the explanation been different. Such a counterfactual can be said to serve the purpose of a second case and, if so, the real and counterfactual cases together might constitute a controlled comparison. However, such a claim rests on the supposition that the causal variable in question was a necessary condition for the occurrences of that outcome, at least in the particular case in question. It also assumes that the causal variable identified operated

53. Ibid., p. 155.

54. The uses and limitations of counterfactual analysis are also discussed in Chapter 8. See also Kaplan, *Conduct of Inquiry*, pp. 21, 91, 160; and James D. Fearon, "Counterfactuals and Hypothesis Testing in Political Science," *World Politics*, Vol. 43, No. 2 (January 1991), pp. 169–195. However frequently counterfactual analysis is employed, it lacks explicit criteria and standards for distinguishing good practice from often highly speculative, less disciplined uses. An important effort to explicate standards for counterfactual analysis is Philip E. Tetlock and Aaron Belkin, eds., *Counterfactual Thought Experiments in World Politics* (Princeton, N.J.: Princeton University Press, 1996).

independently of other causal variables. Such assumptions are often difficult to substantiate, a fact that makes the use of a counterfactual problematic.

Thus, one must recognize that a plausible, useful counterfactual case is often not possible and, if attempted, does not add much, if anything, in support of a within-case historical explanation. It is very difficult if not impossible to conduct a plausible, useful counterfactual when the explanation for a historical event is *very complex*. "Complexity" can take several different forms, for example:

When many variables, though independent of each other, are part of the historical explanation (as is often the case), it is difficult to formulate a plausible counterfactual.

When the historical explanation is in the form of *a sequential development over time*, and not a single variable or cluster of variables at a given point in time—i.e., when the explanation is not derived from a simple "before-after" comparison—then it is very difficult to formulate a plausible counterfactual case.

When the causal variables in the historical explanation are not independent of each other but *interdependent*, then formulation of a plausible counterfactual case is exceedingly difficult, since it requires varying a number of causal variables and runs into the difficulty of weighing the precise weight of each variable.

For these reasons, we believe that the burden of supporting a historical explanation must be met not by using a counterfactual but by employing the process-tracing method in order to infer and construct a causal chain account of how various conditions and variables interacted over time to produce the historical outcome. In any case, counterfactual support for the explanation of a historical outcome is not needed if that explanation is supported by a strong theory or generalization; or if the causal chain is highly plausible, consistent with the evidence, and survives comparison with alternative explanations.

This is not to discourage investigators from trying to develop plausible, useful counterfactual cases but to alert them to the difficulties that stand in the way. While we believe that in principle a counterfactual is not needed to support any historical explanation, we recognize that opinions on this question differ and are content to rest our argument on the ground that plausible counterfactuals are generally infeasible, for the reason indicated here and in Chapter 8. This is not to deny the possibility that forcing oneself to attempt counterfactual analysis—even under such adverse conditions—may be useful in clarifying the process-tracing basis for the explanation.

There is another, quite different question that needs to be recognized and discussed. The preceding discussion focused on getting a good explanation for a given historical outcome. But the investigator may want to undertake a different task—namely, to address the question of whether an outcome other than the historical outcome would have been possible if some of its causes could have been different. This question is often raised when observers are dissatisfied with the historical outcome and argue that policymakers could have achieved a better outcome if they had acted differently. For this type of exercise, a robust counterfactual is required—one that purports to identify the critical variable(s) and the alternatives actually available (considered and rejected) that might have produced a better outcome if they had been adopted. This type of reasoning often accompanies or underlies the assertion that in a given situation there was a "missed opportunity" to accomplish a desirable or better outcome.[55]

In this chapter we have discussed varieties of process-tracing and the different forms of causal processes to which process-tracing can be applied. In addition, we have discussed the various uses of this method in the formation, development, and the testing of theories, as well as the limitations of process-tracing. Finally, we have added a detailed discussion of historical explanation and indicated how it differs from process-tracing.

55. See, for example, Alexander L. George and Jane Holl, "The Warning and Response Problem and Missed Opportunities for Preventive Diplomacy," a Report to the Carnegie Commission on Preventing Deadly Conflict (May 1997); Bruce W. Jentleson, ed., *Opportunities Missed, Opportunities Seized: Preventive Diplomacy in the Post–Cold War World* (Lanham, Md.: Rowman and Littlefield, 1999); and Deborah Welch Larson, *Anatomy of Distrust: U.S.-Soviet Relations During the Cold War* (Ithaca, N.Y.: Cornell University Press, 1997).