CHAPTER 1

Process-Tracing in the Social Sciences

You know a conjurer gets no credit when once he has explained his trick; and if I show you too much of my method of working, you will come to the conclusion that I am a very ordinary individual after all.

—Sherlock Holmes (A. C. Doyle 2010: 33)

The essence of process-tracing research is that scholars want to go beyond merely identifying correlations between independent variables (Xs) and outcomes (Ys). For example, a strong statistical correlation has been found between democracy and peace (Oneal, Russett, and Berbaum 2004). Yet how do we know that mutual democracy was the cause of peace between two nations? How does democracy produce more peaceful relations? Answering these questions requires that we unpack the causal relationship between mutual democracy and peace to study the causal mechanism linking the two concepts.

Process-tracing in social science is commonly defined by its ambition to trace causal mechanisms (Bennett 2008a, 2008b; Checkel 2008; George and Bennett 2005). A causal mechanism can be defined as "a complex system, which produces an outcome by the interaction of a number of parts" (Glennan 1996: 52). Process-tracing involves "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" (George and Bennett 2005: 206–7).

Investigating causal mechanisms enables us to go a step further when studying causal relationships, allowing us to "peer into the box of causality to locate the intermediate factors lying between some structural cause and its purported effect" (Gerring 2007a: 45). Yet process-tracing methods are argu-

ably the only method that allows us to study causal mechanisms. Studying causal mechanisms with process-tracing methods enables the researcher to make strong within-case inferences about the causal process whereby outcomes are produced, enabling us to update the degree of confidence we hold in the validity of a theorized causal mechanism. Process-tracing therefore represents "an invaluable method that should be included in every researcher's repertoire" (George and Bennett 2005: 224).

Process-tracing methods have recently experienced a surge in popularity within qualitative social science, with numerous doctoral students and established scholars attempting to use process-tracing methods in their research (e.g., Bennett and Elman 2006a, 2006b; Elman 2004; Hall 2008; Jacobs 2004; Khong 1992; Lehtonen 2008; Owen 1994). Yet despite the widespread use of process-tracing in empirical research and an increasing body of methodological literature on process-tracing and causal mechanisms, we still do not possess a clear and coherent framework for how and when valid inferences can be made using process-tracing. We also lack a set of concrete guidelines for using the methods in practice. This deficiency has prevented process-tracing from fulfilling its potential of enabling us to open up the black box of causality using in-depth case study methods to make strong within-case inferences about causal mechanisms.

In this book, we seek to reveal how the trick is performed. In so doing, we show readers that process-tracing is an "ordinary" social science method, like many others, with comparative strengths and weaknesses. It is not a panacea, but when applied in appropriate research situations, it can enable us to make strong within-case causal inferences about causal mechanisms based on in-depth single-case studies that are arguably not possible with other social science methods.

1.1. Defining Process-Tracing

Process-tracing methods are tools to study causal mechanisms in a single-case research design. While scholars generally agree that process-tracing methods can be defined by their ambition to trace causal mechanisms, the existing literature retains considerable confusion about both the ontological and epistemological foundations of process-tracing methods and guidelines for what good process-tracing entails in practice. Basic questions such as what types of causal mechanisms are being traced and to what degree

process-tracing case studies can be nested in broader, mixed-method research designs have been left relatively unanswered. The resulting lack of coherent foundations and concrete guidelines has prevented the method from fulfilling its potential.

This confusion results partly from the literature's definition of process-tracing as a single research method. A lot of the murkiness about what process-tracing is and how it should be used in practice can be cleared up by differentiating process-tracing into three variants within social science: theory-testing, theory-building, and explaining-outcome. The three differ along several dimensions, including whether they are theory- or case-centric, the types of inferences being made, how they understand causal mechanisms, and whether and how they can be nested in mixed-method designs.

Theory-testing process-tracing deduces a theory from the existing literature and then tests whether evidence shows that each part of a hypothesized causal mechanism is present in a given case, enabling within-case inferences about whether the mechanism functioned as expected in the case and whether the mechanism as a whole was present. No claims can be made, however, about whether the mechanism was the only cause of the outcome.

Theory-building process-tracing seeks to build a generalizable theoretical explanation from empirical evidence, inferring that a more general causal mechanism exists from the facts of a particular case. Although this type of process-tracing is analytically useful, to our knowledge, the literature offers no guidelines about how to proceed with this approach.

Finally, explaining-outcome process-tracing attempts to craft a minimally sufficient explanation of a puzzling outcome in a specific historical case. Here the aim is not to build or test more general theories but to craft a (minimally) sufficient explanation of the outcome of the case where the ambitions are more case-centric than theory-oriented. This distinction reflects the case-centric ambitions of many qualitative scholars and echoes arguments found in the burgeoning literature on topics such as eclectic theorization (where the case is front and center) (Sil and Katzenstein 2010) and pragmatism as a research strategy (Friedrichs and Kratochwill 2009). Accounting for the outcome of a case usually requires an eclectic combination of different mechanisms, some of them case-specific/nonsystematic (see chapters 2 and 4).

We do not suggest this differentiation for its own sake. Instead, by identifying three variants, we can bring alignment between what we practice and what we preach, as these differences have important methodological impli-

cations for research design that are masked when we treat process-tracing as a single method.

1.2. How Process-Tracing Differs from Other Case Study Methods

Taken together, process-tracing methods can be distinguished from most other small-*n* case study methods by the types of inferences being made. Process-tracing seeks to make within-case inferences about the presence/absence of causal mechanisms in single case studies, whereas most small-*n* methods attempt cross-case inferences about causal relationships. These different inferential ambitions require different logics of inference, resulting in fundamentally different methodologies (see chapter 5).

Few case study methods enable within-case inference, and the most prominent alternative to process-tracing is what George and Bennett term the *congruence method* (2005: chapter 9). In the congruence method, based on the value of the independent variable (X), researchers test whether the prediction about the outcome that should follow from the theory is congruent with what is found in the case, investigated either temporally or other across aspects of the outcome(s) (181–204; Büthe 2002).

The congruence method is often used as a way of structuring a narrative of a historical process, testing predicted values of X and Y at different times during an empirical process (t_0, t_1, . . . t_n) (Büthe 2002). "In addition to presenting information about correlations at every step of the causal process," this type of narrative case study "can contextualize these steps in ways that make the entire process visible rather than leaving it fragmented into analytical stages" (486). For example, Tannenwald's (1999) study of the nuclear taboo involves congruence case studies where she investigates whether the observable implications of X (norms against using atomic weapons) measured as "taboo talk" or Z (material factors) measured as "materialist arguments" are present in decision-making processes within the U.S. government. She uses a historical narrative of four cases of nuclear use and nonuse and finds a strong correlation between the presence of taboo talk (X) and nonuse of nuclear weapons (Y) in three cases where nuclear weapons could conceivably have been used.

What marks the difference between the congruence method and process-tracing methods is the explicit focus on investigating causal mechanisms. Congruence investigates correlations between X and Y, whereas process-tracing investigates the workings of the mechanism(s) that con-

tribute to producing an outcome. Process-tracing methods go beyond correlations by attempting to trace the theoretical causal mechanism(s) linking X and Y.

Process-tracing case studies usually cannot be presented in narrative form, in contrast to what Rubach (2010) and others have argued. While evidence in the form of events or temporal sequences can be relevant in testing the presence of one part of a causal mechanism, depending on the type of observable implications that are predicted (see chapter 6), other types of evidence such as pattern evidence (e.g., the number of documents produced by different agencies) can be relevant for testing other parts of the mechanism. Process-tracing case studies should therefore usually be presented as a stepwise test of each part of a causal mechanism, especially in the theory-testing variant. For example, Owen's (1994) study of the democratic peace mechanism is presented as a step-by-step test of each part of his theorized mechanism instead of a narrative of events in the case (see chapter 5).

1.3. Themes of the Book

Process-tracing methods are used when we want to gain a greater understanding of the nature of causal relationships than can be provided by other social science case study methods, such as comparative cross-case methods. However, a key deficiency in the existing methodological literature on process-tracing is the absence of sufficient exposition of the logical foundations of the method or research design, especially with regard to how process-tracing differs from other qualitative case study methods.

This book rectifies this omission by exploring in detail how the ontological and epistemological foundations of process-tracing differ from those of other case study methods, such as congruence methods or structured, focused comparisons (for more on these two methods, see George and Bennett 2005). *Ontology* refers to our understanding of the nature of the social world—specifically, here, the nature of causality. *Epistemology* refers to arguments regarding how we should best study causal relationships in the social world. The argument that we present builds on Hall's (2003: 374) assertion that research methodologies and ontology need to be aligned: "Ontology is ultimately crucial to methodology because the appropriateness of a particular set of methods for a given problem turns on the assumptions about the nature of the causal relations they are meant to discover." As chapter 3

establishes, adopting the mechanismic and deterministic ontology of causality of process-tracing implies using quite different methodological tools for empirical analysis than if a regularity understanding of causality forms the basis for theorization. Further, the goal of making within-case inferences about causal mechanisms also implies that a different logic of inference is adopted than if we are using other small-*n* methods such as congruence (see chapter 5).

Chapter 2 explains the three distinct variants of process-tracing, elaborating on what elements they share as well as their crucial differences, which have important methodological implications.

Chapter 3 introduces the reader to the ontological debates within the philosophy of science that deal with the nature of causality to understand how the mechanismic and deterministic understanding of causality used in process-tracing methods differs from other social science methods—in particular, large-*n* statistical analysis and comparative case study research. We then explore different ways of investigating causal mechanisms, including tracing empirical processes, studying them as intervening variables between X and Y, and using mechanismic, system-oriented understandings. We contend that to take seriously the study of causal mechanisms, we should adopt the mechanismic understanding in process-tracing, conceptualizing causal mechanisms as a series of parts composed of entities engaging in activities. In so doing, we focus our analytical attention on the transmission of causal forces through the mechanism. The chapter concludes with a discussion of the different theoretical levels of mechanisms along with the question of whether mechanisms can be directly observed in empirical research.

Chapter 4 deals with questions relating to the theorization of causal mechanisms. How can causal mechanisms best be conceptualized in a manner that enables empirical analysis to capture the workings of mechanisms in a case study? How can causal theories of X→Y be translated into causal mechanisms composed of a set of parts that describe the theorized process whereby an explanatory factor (variable or condition) produces an outcome? Further, how can we work backward from an outcome to build a sufficient explanation that details the causal mechanisms that produced that outcome? We discuss how theoretical concepts and causal theories should be conceptualized in process-tracing before turning to discussion of the specific challenges in working with each of the three variants of process-tracing.

In chapter 5, we discuss why mainstream inferential tools used in both

classical statistical analysis and comparative methods cannot be used to make within-case inferences. Here we continue the argument that methodology must be brought in line with ontology. In particular, we illustrate that the inferential tools used in other social science methods are not applicable in process-tracing, given that we are interested in making within-case inferences about the presence/absence of causal mechanisms. We then present the Bayesian logic of inference and how it can be adapted for use as a tool for making within-case inferences in process-tracing. The chapter concludes by discussing in more detail the types of inferences that can be made using different variants of process-tracing methods and, equally important, what types of inferences cannot be made.

Chapter 6 turns to the question of developing strong empirical tests that investigate whether a hypothesized causal mechanism is present in a single case. Based on the Bayesian logic of inference, our goal in process-tracing is to update our confidence in the presence of a mechanism in light of our empirical tests. To enable updating to take place, our empirical tests need to be designed in a manner that maximizes their inferential power. Each test details the case-specific predictions for what we should expect to see in the empirical record if each part of the hypothesized causal mechanism is present in the case.

Empirical material is then gathered to see whether the predicted evidence is present. However, "raw" empirical observations need to be evaluated for their content, accuracy, and probability before they can be used as evidence that enables us to update our confidence. We discuss the evaluation process in chapter 7, introducing Bayesian-compatible tools for evaluating empirical material. If there is a strong match between the predicted and found evidence for each part of the mechanism, we can infer with a certain degree of confidence that the hypothesized causal mechanism is present in the case based on the Bayesian logic of inference (Bennett 2008a).

Finally, chapter 8 broadens the picture, looking at questions of case selection and whether, when, and how the three variants of process-tracing can be embedded in mixed-method research designs. We discuss case selection for each of the variants, showing why existing prescriptions do not always apply. The chapter argues that the theory-building and -testing variants of process-tracing can be combined with other methods in mixed-method designs, whereas explaining-outcome designs cannot be meaningfully combined with other research methods. The key difference is that the former variants focus on systematic mechanisms, enabling their theories to communicate with those used in other methods, whereas the latter includes nonsys-

tematic, case-specific parts, the inclusion of which limits the generalizability of results.

Finally, the appendix presents a practical checklist for the use of the three different variants of process-tracing, walking through each step of the research process to offer guidelines and questions that can be used to structure a process-tracing analysis.