
Teaching Process Tracing: Examples and Exercises

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Contents

Descriptive Inference	2	Exercise 7. Bennett on the Fashoda Crisis, World War I, and Central Europe in 1989	6
Exercise 1. Lerner on a Turkish Village	2	Exercise 8. Schultz on Democracy and Coercive Diplomacy	6
Exercise 2. Fenno on Members of Congress	2	Exercise 9. Freedman on Breakthroughs in Epidemiology	7
Exercise 3. Tannenwald on the Nuclear Taboo	3	Exercise 10. Rogowski on Strong Theory	7
Causal Inference	4	Exercise 11. Sherlock Holmes: A Master of Process Tracing?	8
Exercise 4. Brady on the 2000 US Presidential Election	4	Acknowledgment and Notes	8
Exercise 5. Skocpol et al. on US Civic Associations	4	References	9
Exercise 6. Weaver on Punitive Crime Policy in the United States	5	Appendix. Text of Sherlock Holmes Story: "The Adventure of Silver Blaze"	

Learning and teaching process tracing is an important goal, both for qualitative researchers and for scholars who wish to supplement other methodologies with insights from within-case analysis. The examples and exercises presented here seek to advance this goal.

Process tracing is the systematic examination of diagnostic pieces of evidence, typically viewed in a chronological sequence, with the objective of evaluating hypotheses formulated by the investigator. This method has been developed in a series of studies, above all by Alexander George and Andrew Bennett, which explicate and refine the technique.¹

Ironically, as Zaks (2011) has pointed out, although process tracing now receives substantial attention as a research procedure, the substantive studies evoked by methodologists to illustrate process tracing typically do not identify this as their method. These studies, correspondingly, do not use the diagnostic tests commonly discussed in methodological statements on this approach. Hence, both for researchers who wish to strengthen their substantive work through explicit use of process tracing, as well as for methodologists interested in new approaches to within-case analysis, the wider diffusion of this method is much needed.

The examples and exercises presented here are intended to accompany "Understanding Process Tracing" (Collier 2011) and are cross-referenced to that article. The examples span the fields of American politics, international relations, comparative politics, and public health, as well as detective fiction: a Sherlock Holmes mystery story. In the framework of the Collier article, good description and careful causal inference are both central to process tracing. The examples address both of these challenges, and the exercises are grouped according to whether they focus on description or causal assessment.

Among these substantive examples, only Bennett's (2010) analysis of international relations explicitly uses the language of process tracing. This reflects Zaks's point: much research that can be treated as process tracing does not explicitly state that this is the method used. However, two examples apart from Bennett—Brady and Freedman—adopt the language of causal-process observations, which are seen here as a basic building block of process tracing (Collier 2011, 823).

Four additional points should be underscored about these exercises. First, the appropriate set of examples and questions will depend on participants' substantive interests and background knowledge. For instance, the Bennett and Freedman readings each cover several examples, and it may be productive to focus on only one or two from each author. Also, some questions refer to alternative types of background knowledge. Answering such questions may require familiarity with the wider literature of which the example is a part, and these questions might be skipped by those not familiar with the relevant literature.

Second, among the exercises, several focus on journal articles, allowing easy online access through college and university libraries. Others are readily available as chapters in Brady and Collier (2010). For the studies by Lerner, Tannenwald, Fenno, and Skocpol et al., an expanded form of the argument is available as a book. Although the questions on these authors are designed to be answered with the articles, certain questions can be answered more fully, based on the books.

Third, in doing the exercises, one sometimes must deal with ambiguities in the specification of hypotheses, the assumptions that undergird the analysis, and the interpretation of tests. Of course, such ambiguities can be challenges with any research method, including statistical analysis, and they remind us that quantitative and qualitative research are both hard to do well (Brady, Collier, and Seawright 2010, 22). These ambiguities in process tracing are discussed

briefly by Collier (2011, 825–27 and tables 4 and 5), who illustrates alternative interpretations of evidence that result from different assumptions adopted by the researcher.

Fourth, Zaks (2011) has introduced a major innovation in process tracing that is applied in some of the exercises. She demonstrates that adequate interpretation of tests must consider the specific relationship between the main hypothesis and the rival hypothesis of central concern. These two hypotheses may be *mutually exclusive*: acceptance of one entails rejection of the other—yielding a strong test. Alternatively, they may be *coincident*: they work independently of one another in producing the outcome—which means that affirming one is not a test of the other. Finally, they may be *congruent*: they interact and jointly produce the outcome. Here again, a given test may make a much weaker contribution to rejecting the rival hypothesis.

As with the challenge of specifying the statistical model in quantitative research, in process tracing placing the hypotheses in one of Zaks's three categories depends on assumptions and background knowledge. Yet compared to statistical analysis, process tracing can have the advantage that the investigator has close insight into specific cases—potentially making it easier to arrive at plausible and appropriate assumptions.

Zaks's distinctions should be treated as a supplement to the norms about the strength of tests summarized in Collier's (2011) table 1. At certain points in the exercises, these distinctions are explicitly noted in the questions; at other points, readers may find it productive to introduce them in their responses.

Descriptive Inference²

Although process tracing typically involves the causal analysis of processes that unfold over time, this analysis fails if it is not founded on careful description. Hence, good description of what in a sense are static, cross-sectional slices of reality is a crucial building block for process tracing.

EXERCISE 1. LERNER ON A TURKISH VILLAGE

Lerner, Daniel. 1958. "The Grocer and the Chief: A Parable." Chapter 1 in Lerner, *The Passing of Traditional Society: Modernizing the Middle East*. New York: The Free Press, 1958. Although it is not required for the exercises, a fuller examination of Lerner's entire book will provide further insight into the goals and methods of chapter 1.

Introduction. Lerner's case study is the first chapter in his book, *The Passing of Traditional Society*,³ which analyzes social and economic change in the Middle East, using a large cross-national opinion survey.⁴ Lerner's chapter presents a microcosm of these wider processes of change by examining the dramatic "modernization" in a Turkish village between 1950 and 1954. This transformation results from the election of a new national governing party and the subsequent introduction of infrastructure that includes electricity and a modern road to Ankara. The rapid change in the village is thus the dependent variable, and the author's goal is to tease out what modernization means in this context. The chapter includes dozens of specific observations of people, social interactions, and material conditions that provide remarkable insight into this dependent variable. Lerner's study not only illustrates the kind of descriptive inference needed in process tracing, but more broadly the chapter gives readers excellent practice in examining and evaluating fine-grained evidence.⁵

Questions on Lerner

1. Observations, Overarching Concepts, and Change over Time.

1a. Make an inventory of the observations that are woven into this case study. Your inventory should include information about social attributes and interactions; demographic characteristics; and material objects, physical infrastructure, and commercial establishments. You should be able to find a large number of these observations.

1b. Organize the inventory by identifying a smaller number of overarching concepts, for which these numerous observations serve as specific indicators, and use these concepts to group the observations. For example, one such concept could be occupation.

1c. Information is reported for both 1950 and 1954. Note carefully which observations for 1954 reflect change over time.

2. Empathic Personality. A key concept in Lerner's book is the empathic personality, involving "empathic capacity," a characteristic of individuals who have a strong ability to imagine themselves in different life situations than their own.⁶ Lerner contrasts this with the "constrictive personality" (49–51). Based on the answers to Question 1, identify evidence about empathic versus constrictive personalities. Does the evidence point to change between 1950 and 1954?

3. Metaphors for Change. In Lerner's analysis, the grocer, the chief, and the chief's sons are in part a metaphor for change. Discuss this metaphor and analyze the wider transformations it reflects.

4. Theoretical Background. Lerner presents his evidence in a way that makes his analysis appear strongly inductive, yet modernization theory in fact guides his decisions to focus on certain kinds of evidence. Characterize the prior knowledge he brings to this study. (The answer requires some knowledge of modernization theory.)

5. Transition to a Large-N Data Set. Some of the information presented in Lerner's chapter—for example, demographic data—is quantitative, and other data may be aggregated into quantitative variables. In the spirit of pursuing multimethod research, consider which observations and variables are quantitative or might be treated as quantitative. Identify aspects of change analyzed in the article for which this shift is easy and appropriate, and those which do not lend themselves to quantitative analysis.

EXERCISE 2. FENNO ON MEMBERS OF CONGRESS

Fenno, Richard. 1977. "U.S. House Members in Their Constituencies: An Exploration." *American Political Science Review* 71 (3): 883–917. Fenno's research is also reported in Fenno 1978, 2000, 2003, 2007. More elaborate answers for this exercise could also draw on these sources, but need not do so.

Introduction. Fenno's research is highly regarded for its rich description of how members of Congress interact with their constituents. His 1977 article describes what he calls members' "home style," that is, their perceptions of constituents and their activities in representing them. This description is then used in Fenno's other studies that seek to explain patterns of representation in the House. By focusing on home districts, rather than on Washington, DC, Fenno makes a major contribution to the field of American politics. His method is close observation of House members, which he calls "soaking and poking," or "just hanging around." This article reports the dimensions and categories that Fenno derives for describing representation, based on this method.

Questions on Fenno

1. Representational Styles and Types of Constituencies. Fenno describes three dimensions of representation and four types of constituencies.

1a. As a baseline for the rest of the discussion, summarize these dimensions and types in approximately one sentence each—including the idea of concentric constituencies.

1b. Make an inventory of the evidence Fenno uses to identify and characterize each of these dimensions and types.

1c. Discuss whether any of these dimensions or types are especially well measured by Fenno's observations—or poorly measured. For the instances of less adequate measurement, suggest additional data that might help address this problem.

2. Soaking and Poking.

2a. Discuss concretely what Fenno does when he is soaking and poking. Whom does he talk to? How does he get good access and establish his credibility with interviewees? What additional data sources does he use?

2b. Concept formation is a foundation of good description. Explain how Fenno generates the dimensions and categories he uses.

2c. Summarize what Fenno says about his sampling strategy (884). Are you satisfied with this strategy? Is it appropriate for exploratory research? You might consider Fenno's discussion in light of Tansey's (2007) argument about strategies of case selection in process-tracing research.

3. Fenno's Wider Contribution.

3a. Discuss Fenno's view of the leverage provided by in-depth interviews. Note that, in addition to his 1977 *APSR* article (the focus of this exercise), Fenno offers a further perspective on this question in Fenno (1986), which is readily accessible online.

3b. It might be claimed that Fenno's research does not add much to classic rational choice models of legislative behavior. These models might hold that representatives make multi-faceted calculations of advantage within the legislative arena; yet they are single-minded reelection seekers vis-à-vis their constituencies—because they know “where the rewards are” (Denzau, Riker, and Shepsle 1985, 1118). By contrast, Aldrich and Shepsle (2000) maintain that Fenno's soak-and-poke methodology is a necessary complement to rational choice theories of political action because it provides a way of understanding behaviors that rational choice models would otherwise treat as anomalous. Based on Fenno's article, provide one or more examples of House members' behavior that is anomalous or under-theorized by rational-choice theory—given that this theory views representatives as single-minded reelection seekers.

3c. Consider whether Fenno's descriptive work suggests hypotheses that might explain variations in the following: (i) level of expenditure on home district offices and staff; (ii) time spent in the home district; (iii) issue-oriented versus person-to-person self-presentation to constituents; (iv) effort to explain Washington activity to constituents. If it does suggest such hypotheses, list one or more of them.

EXERCISE 3. TANNENWALD ON THE NUCLEAR TABOO

Tannenwald, Nina. 1999. “The Nuclear Taboo: The United States and the Normative Basis of Nuclear Non-Use.” *International Organization* 53 (3): 433–68. For a book-length treatment of this topic, see Tannenwald 2007.

Introduction. Tannenwald analyzes the use versus non-use of nuclear weapons by the United States in four historical episodes: the end of World War II, when these weapons were used, and the Korean, Vietnam, and First Gulf Wars, when they were not used. Tannenwald's central concern is with a “normative” explanation: the existence of an ethical “nuclear taboo,” which she understands as “a particularly forceful kind of normative prohibition” for policy-makers. The existence or non-existence of this taboo is hypothesized to explain the (analytically distinct) outcome of the actual use or non-use of nuclear weapons. Tannenwald's study provides an excellent basis for an exercise because she makes extensive use of process tracing to establish in descriptive terms the existence/non-existence of this taboo across the four wars. Her study is quite different from Lerner's, in that she also devotes extended attention to formulating and testing rival explanations. The discussion of Tannenwald therefore serves as a bridge between the exercises that focus on descriptive inference and those that address causal inference.

Questions on Tannenwald

1. Describing the Taboo.

1a. Make an inventory of the observations used by Tannenwald to establish the existence/non-existence of the taboo.

1b. Tannenwald uses diverse types of sources and reports. List these and group the corresponding observations under each.

1c. Evidence about the existence of the taboo comes not only from statements by policy-makers who supported it, but also from individuals who opposed and objected to it. Consider this second type of evidence. Does it increase the plausibility of Tannenwald's argument?

2. Rival Explanations. Alternative hypotheses are crucial in Tannenwald's analysis.

2a. Summarize the hypothesized explanations that she considers.

2b. Discuss which hypotheses are derived from international relations theory, as opposed other lines of analysis. What prior knowledge goes into constructing these hypotheses? (A detailed answer will require some knowledge of international relations theory. Question 2b might therefore be skipped in some contexts.)

2c. Comment on the evidence provided for evaluating these rival explanations.

2d. Tannenwald underscores the possibility of reciprocal causation between the nuclear taboo and rival explanatory factors—for example, the interaction among the taboo, the lack of preparedness for tactical nuclear warfare, and debates on the availability of suitable targets. Review the evidence she uses in addressing this issue.

2e. Based on Zaks's framework, evaluate whether these rival hypotheses are mutually exclusive vis-à-vis her main hypothesis about the nuclear taboo. Alternatively, are they coincident or congruent?

3. Comparing the Wars. Consider differences among the Korean, Vietnam, and the First Gulf War in the kind of evidence available and the inferences made. Is there better data for any one or two of the wars? Does the taboo take a distinct form at different points in time?

4. Criticism and Debate. Evaluate the sharp disagreement between Beck (2010), as opposed to Collier, Brady, and Seawright (2010), over the viability of Tannenwald's analysis. For example, Beck (2010) dismisses Tannenwald's study, given his skepticism about using as evidence the statements made by policy-makers to account for their decisions. Regarding policy-makers, Beck argues that

...sometimes they tell stories we like, and we are happy, and sometimes not. So a study of what policy-makers said about why they did not want to use nuclear weapons is clearly interesting, but it is a different study from (the impossible one) of the causes of the US using or not using nuclear weapons after World War II. (Beck 2010, 502)

Thus, Beck not only rejects Tannenwald's process-tracing methodology, but he claims it is impossible to study what was certainly one of the most important issues of international politics in the Cold War Era. Apparently it is impossible because for Korea, Vietnam, and the First Gulf War, there is no variance on the dependent variable (Beck 2010, 502).

Assess Beck's position. Among other things, his challenge suggests the value of scrutinizing Tannenwald's sources of evidence. How reliable are these sources? Your answer might draw on the crucial issue raised in Question 1c, as well as by Collier, Brady, and Seawright (2010, 509), who strongly dissent from Beck's evaluation of Tannenwald.

Causal Inference

Causal inference is the more familiar focus of process tracing—involving assessment of explanatory hypotheses on the basis of carefully selected pieces of diagnostic evidence. As already emphasized, adequately assessing hypotheses must build on a foundation of good description. Yet the central focus in standard discussions of process tracing is on causal inference.

EXERCISE 4. BRADY ON THE 2000 US PRESIDENTIAL ELECTION

Brady, Henry E. 2010. "Data-Set Observations versus Causal-Process Observations: The 2000 U.S. Presidential Election." In Henry E. Brady and David Collier, eds., *Rethinking Social Inquiry*, 2nd ed. Lanham, MD: Rowman and Littlefield.

Introduction. Brady's chapter debates the findings of John Lott, who uses regression analysis to claim that in the 2000 presidential election in Florida, the early and incorrect media call in favor of Gore suppressed the Bush vote in the Florida Panhandle. The Panhandle is on Central Time, and Lott argues that the media call discouraged Bush supporters from voting in the period just before the polls closed, and that Bush therefore lost at least 10,000 votes. Brady disagrees, using process tracing⁷ to demonstrate that the early media call had virtually no effect in suppressing the vote for Bush.

Questions on Brady

1. The Basic Arguments. Summarize the arguments advanced by Lott and by Brady in evaluating the voting outcome in the Florida Panhandle.

2. Relationship between the Arguments. Evaluate, based on Zaks's (2011) framework, whether Lott's and Brady's hypotheses are mutually exclusive, given that Brady's argument could be seen as simply the null hypothesis vis-à-vis Lott's claims. Alternatively, is the relationship between the two arguments more complex?

3. Inventory of Tests. Make an inventory of the process-tracing tests employed by Brady, following the format of tables 3 to 7 in Collier (2011) that enumerate the hypothesis, clue, inference, and summary of the test.

4. Types of Tests. Locate these tests within the typology in Collier's table 1 and in the causal sequence framework of independent, intervening, and dependent variables—and auxiliary outcomes (Collier 2011, 825–26, 828).

5. Prior Knowledge. Brady draws on prior studies of voting behavior in the United States to establish diagnostic criteria for evaluating his argument. Evaluate this prior knowledge.

6. Process Tracing with Quantitative Data. Brady's tests are based on large-N, quantitative data. Discuss why Brady nonetheless presents this as an example of process tracing, a method typically associated with qualitative analysis.

7. Least-Likely Case. Brady suggests (242) that his study—based as it is on large-N, quantitative electoral data—is a "least-likely case" for demonstrating the relevance of the qualitative reasoning associated with process tracing.⁸ Due to the extensive quantitative data available, one might expect that these qualitative tools would not be relevant. Brady argues that they *are* relevant, and that this example therefore provides a particularly strong demonstration that these research procedures are important. Discuss this argument. Do you agree, or disagree? Why?

8. Extending the Study. Brady states (241) that if he were to pursue the analysis further, he would seek additional process-tracing evidence, rather than developing a quantitative data set, even though he is analyzing mass political behavior. Evaluate whether this is an appropriate strategy. Why or why not?

EXERCISE 5. SKOCPOL ET AL. ON US CIVIC ASSOCIATIONS

Skocpol, Theda, Marshall Ganz, and Ziad Munson. 2000. "A Nation of Organizers: The Institutional Origins of Civic Voluntarism in the United States." *American Political Science Review* 94 (3): 527–46. For a book-length treatment of this topic, see Skocpol 2003.

Introduction. Many scholars have viewed the emergence of civic associations in the United States during the 19th century as strongly grounded in local communities. Both the push to create civic associations and the activities of these associations are seen as centered in small jurisdictional units, ranging from urban centers to small hamlets. What might be termed the "localist" thesis thus posits that (i) large trans-local voluntary associations have not been a widespread or durable part of civil society in the United States; and further, (ii) the creation of trans-local organizations, when it did occur, was usually preceded by a substantial phase of localist organizing. In challenging this thesis, Skocpol and her collaborators seek to demonstrate that between 1890 and 1940, a major part of the initiative for organizing civic associations took place at the trans-local level. Even when the associations were initially organized at the local level, associations at the state and national level played a critical role in subsequent organizing efforts, and in particular were crucial in leading additional organizing at the local level. Furthermore, associations tended to have a national-state-local structure, and the authors aim to explain why. They hypothesize that the federated structure adopted by associations is explained by the institutional design of the American state. Because state capacity was present at all three levels of the federal polity, groups used this "well-understood, already legitimate" structure to attract

members and win allies (533). To test these descriptive and explanatory hypotheses, the authors assemble an impressive array of both quantitative and qualitative archival evidence.

Questions on Skocpol et al.

1. Descriptive Claims.

1a. State Skocpol et al.'s descriptive claims regarding the character and origin of US civic associations.

1b. Identify the evidence used by the authors to evaluate these claims.

2. Explanatory Claims.

2a. Summarize the explanatory claims made by Skocpol et al.

2b. Describe the tests employed by the authors. Do these tests fit into the cells of table 1 in Collier (2011)?

2c. Overall, evaluate the authors' assessment of rival hypotheses. Do you find their treatment convincing?

3. Prior Knowledge.

3a. Discuss the prior knowledge Skocpol et al. use to generate concepts, hypotheses, and diagnostic criteria. This prior knowledge may include previously published theoretical work, as well as empirical evidence from earlier studies.

3b. Evaluate the use of prior knowledge in this study. Might it be improved?

3c. The localist thesis has been strongly embraced by a number of scholars, many cited in this article. Identify the critiques they might have of Skocpol et al.'s (i) review of prior knowledge, (ii) formation of hypotheses, (iii) diagnostic criteria, and (iv) presentation of evidence.

3d. Consider whether normative theories of democracy in the United States are part of the prior knowledge that guides Skocpol et al.'s analysis. This might include, for instance, the idea that small, local associations are more (or less) likely to generate virtuous forms of civic engagement. Are these normative theories relevant in establishing the authors' empirical expectations, for example, that national, federated civic organizations were part of the organizational landscape in the late 19th and early 20th centuries?

4. **Which Kinds of Associations Persist?** Skocpol et al. argue that a key feature of multitiered civic associations was their greater durability in the late 19th and early 20th centuries, compared to nonfederated groups. Discuss the implication of this finding for the comparison in the authors' table 3, which shows that early in the 20th century, the federated associations were three-and-a-half times more numerous than those that were nonfederated. To the extent that the analysis is focused on the emergence of associations, is it possible that—given their shorter persistence—the proportion of nonfederated associations at the later point in time underrepresents their relative importance at the time of origin? Thus, for the purpose of Skocpol et al.'s analysis of the groups' emergence, do the authors risk undercounting the nonfederated associations? Does the analysis take this potential undercounting into consideration? If so, how? If not, how might this be accomplished?

EXERCISE 6. WEAVER ON PUNITIVE CRIME POLICY IN THE UNITED STATES

Weaver, Vesla M. 2007. "Frontlash: Race and the Development of Punitive Crime Policy." *Studies in American Political Development* 21 (2): 230–65.

Introduction. Vesla Weaver's study addresses an important puzzle in the evolution of U.S. crime policy in the 1960s. Overall, this might be thought of as a progressive period: the Johnson Administration's Great Society programs to mitigate poverty; the remarkable gains in equal protection and equality that derived from the civil rights movement, the Civil Rights Act, and the Voting Rights Act; and Supreme Court rulings that expanded the rights of defendants in legal cases. Yet this same period saw the introduction of major new punitive initiatives in crime policy, such as mandatory minimum sentencing and provisions for trying juveniles as adults. The longer-term consequences of the new policies would prove dramatic. For example, between 1973 and 2000, the total US prison population increased more than six-fold. Given the progressive context of the 1960s, how does one explain this major shift in crime policy? Was there in fact a dialectical relationship between the progressive and punitive facets of US policy? Weaver takes on these questions through a sophisticated analysis focused on what she calls "frontlash," that is, agenda-setting by a conservative coalition that preemptively shifts its attention to crime policy after suffering defeats in other policy domains.

Questions on Weaver

1. **Hypotheses.** Weaver offers three hypotheses about the evolution of crime policy in the United States: backlash, frontlash, and (secondarily) crime-was-not-the-cause.

1a. Summarize these hypotheses. Note that the first two—above all, frontlash—are complex, multistep arguments. Be sure to capture this in your summary.

1b. Discuss whether the racialization-of-crime argument is an additional hypothesis. Is it an intervening variable through which frontlash crystallized? Alternatively, is it best understood simply as a component of this process?

1c. Try to identify rival explanations to account for the change in crime policy, using the information offered by Weaver or other information you can locate.

2. **Description.** Adequate testing of these hypotheses must rest on careful description.

2a. Weaver's study argues that crime policy became more punitive during the 1960s. Review her evidence. Using the information she provides (and other sources if you wish), consider policy change at both the federal level and state level.

2b. Evaluate how adequately the frontlash and backlash hypotheses are conceptualized and operationalized.

2c. Discuss the evidence Weaver offers for the racialization of crime policy and the criminalization of racial struggle. Is it convincing?

3. Testing the Hypotheses.

3a. Identify the diagnostic evidence Weaver offers to test her frontlash hypothesis. The following list may provide guidance in pinpointing relevant steps.

(i) Prior policy battles lost by the conservative coalition.

(ii) The decision to shift the venue of conflict.

- (iii) Preemptive formulation of a new agenda for crime policy.
 - (iv) Focusing events.
 - (v) Extension of concern about the initial focusing events—crime and riots—to concern about the civil rights movement.
 - (vi) Role of public opinion.
 - (vii) Strategic pursuit.
 - (viii) Racialization of crime.
- 3b. Consider whether the diagnostic evidence you identify in question 3a is sufficient to affirm the frontlash hypothesis.
- 3c. The crime-was-not-the-cause hypothesis posits that changes in crime policy are not explained by crime rates. Describe how that hypothesis relates to the backlash and frontlash hypotheses. Because the urban riots of the late 1960s involved widespread destruction of property and criminal violence, can it be concluded that this invalidates the crime-was-not-a-cause hypothesis, given that policy change occurred? Are other aspects of crime relevant here?
- 3d. Indicate where you would place Weaver's tests in Collier's (2011) table 1.
- 3e. State, overall, if are you satisfied with Weaver's assessment of rival hypotheses.

EXERCISE 7. BENNETT ON THE FASHODA CRISIS, WORLD WAR I, AND CENTRAL EUROPE IN 1989

Bennett, Andrew. 2010. "Process Tracing and Causal Inference." In Henry E. Brady and David Collier, eds., *Rethinking Social Inquiry*, 2nd ed. Lanham, MD: Rowman and Littlefield.

Introduction. Bennett illustrates the use of process tracing in causal inference, focusing on explanatory puzzles in international relations and drawing on the highly developed body of prior theory found in that subfield. He focuses on three singular events: the 1898 Fashoda crisis, the transformation of German military strategy during World War I, and the Soviet Union's nonintervention in Eastern Europe in 1989. He indicates explicitly which process-tracing test (see his table 1) is applied at each step, and he focuses especially on hoop tests. As you examine his argument, be alert to whether each test is well matched to the hypothesis being tested.

Questions on Bennett

1. **Prior Knowledge.**
 - 1a. Identify the areas of international relations theory on which Bennett builds his analysis. A brief answer may draw on ideas in his article. A more elaborate answer requires wider knowledge of the international relations literature.
 - 1b. Summarize the link between this prior knowledge and the specific hypotheses he formulates.
 - 1c. State how this prior knowledge guides the selection of diagnostic evidence for testing the hypotheses.
2. **Summarizing the Tests.** Bennett presents numerous hoop tests, one straw-in-the-wind test, and two smoking-gun tests. Describe at least four of these tests. Follow the format in Collier's (2011) tables 3 to 7 for listing the hypothesis, clue, inference, and summary of the test.
3. **Relationship among Rival Hypotheses.** International relations theory suggests various hypotheses to explain the outcomes analyzed by Bennett. Consider whether Zaks's framework for evaluating the relationship among these hypotheses is useful here. Give specific examples.

4. **Scrutinizing the Tests.** Discuss whether Bennett's classification of the tests presented in his study should possibly be amended. That is, are they correctly identified as hoop, straw-in-the-wind, or smoking-gun tests?

5. **Causal Sequence Framework.** Evaluate which of Bennett's process-tracing tests focuses on independent, versus intervening, versus dependent variables, or a combination of these. Is it helpful to make these distinctions?

6. **Criteria for Identifying Diagnostic Evidence.** Summarize whether Bennett's criteria for identifying diagnostic evidence derives from international relations theory, as opposed to other frameworks or theories. Thus, what specific forms of prior knowledge does Bennett bring to this analysis? (A brief answer could rely on Bennett's article. A more complete answer would draw on wider knowledge of international relations theory.)

7. **Convincing?** Given available evidence and the specific hypothesis being evaluated, which of Bennett's tests are most convincing, and which least convincing? Explain this contrast.

EXERCISE 8. SCHULTZ ON DEMOCRACY AND COERCIVE DIPLOMACY

Schultz, Kenneth A. 2001. *Democracy and Coercive Diplomacy*. New York: Cambridge University Press, 175–96 only.

Introduction. This section of Schultz's 2001 book is the principal source used in Bennett's (2010) brief analysis of the Fashoda crisis of 1898. In this crisis, Britain and France resolved their competing imperial claims to the Upper Nile Valley without resorting to the use of force. This event presents a valuable opportunity for testing the mechanisms underlying the interdemocratic peace hypothesis that democracies do not go to war with one another.

Questions on Schultz

1. **Schultz versus Bennett.**
 - 1a. Assess whether Schultz and Bennett draw on basically the same body of theory and prior knowledge.
 - 1b. Discuss whether Schultz, based on a far more detailed analysis, reaches the same or different conclusions from Bennett. Does his analysis cast any of Bennett's tests in a different light? Does Schultz offer tests not used by Bennett?
2. **Two Levels of Generality.** Schultz addresses explanations of the Fashoda crisis at two levels: (i) broad theoretical approaches—for example, neorealism and the theory of democratic peace; and (ii) specific hypotheses derived in part from these theories and in part from elsewhere. Consider the different forms of prior knowledge involved at these two levels.
3. **Evaluating Arguments.** Assess how arguments from these two levels are evaluated through process tracing. What findings emerge?
4. **Lack of Wars between Democracies.** An early explanation offered for the lack of wars between democracies was that democratic publics will not be belligerent because they do not want to impose the costs of a war on themselves.

4a. Identify Schultz's evidence for testing this hypothesis. How is process tracing used to assess this evidence, and what is the outcome of the test?

4b. Compare (i) the central tenets and predictions of the democratic peace thesis with (ii) Schultz's "confirmatory effect," which focuses on the transparency of domestic political processes in democracies.

5. Exceptions to Schultz's Argument. Later in the book Schultz notes cases that do not fit his theory, for example World War I and World War II (e.g., 144–46), and he offers a brief comment on explaining these exceptions. Formulate this comment as a hypothesis, and suggest how process-tracing tests might evaluate it. Can you suggest other hypotheses about these exceptions, as well as how they might be tested? (Note that this final question broadens the focus beyond the section of the book that analyzes the Fashoda crisis.)

EXERCISE 9. FREEDMAN ON BREAKTHROUGHS IN EPIDEMIOLOGY

Freedman, David A. 2010. "On Types of Scientific Inquiry: The Role of Qualitative Reasoning." In Henry E. Brady and David Collier, eds., *Rethinking Social Inquiry*, 2nd ed. Lanham, MD: Rowman and Littlefield.

Introduction. Freedman argues that qualitative evidence played a crucial role in major, historical innovations in epidemiology. These innovations, in addition to their importance for public policy, are also relevant models for political science methodology. Freedman examines six breakthroughs: discovering smallpox vaccine and penicillin, and establishing the causes of cholera, pellagra, beriberi, and puerperal/childbed fever. Freedman's goal is to demonstrate that, in each case, qualitative evidence made a crucial contribution; qualitative and quantitative analysis worked together; and this qualitative analysis is so important as to be a "type of scientific inquiry" in its own right.

Questions on Freedman

1. Prior Theory. For these breakthroughs in research, discuss the state of prior theory—or perhaps more modestly, the commonly held prior hypotheses. How did these hypotheses focus the search for evidence? The role of a prior hypothesis is clear in John Snow's study of cholera. Compare Snow's analysis in this regard to some of the other studies discussed by Freedman.

2. Inventory of Tests. Give examples of the process-tracing tests (i.e., straw-in-the-wind, hoop, etc.) that play a key role in the studies examined by Freedman. As appropriate, follow the format of Collier's (2011) tables 3 to 7 by identifying the hypothesis, clue, and inference, and providing a summary of the tests.

3. Specific Contribution of Qualitative Evidence. Freedman (232) argues that in his examples, qualitative evidence contributes to three tasks: "refuting conventional ideas if they are wrong, developing new ideas that are better, and testing the new ideas as well as the old ones." Review how key pieces of diagnostic evidence from Freedman's case studies contribute to one or more of these tasks.

4. Exemplar: Snow's Cholera Study. Reread in Freedman's chapter the discussion of Snow on cholera, and also examine closely the discussion of Snow in Dunning (2010), including the placement of

Snow in Dunning's figures 14.1, 14.2, and 14.3. Both Freedman and Dunning underscore the importance of integrating qualitative and quantitative evidence.

4a. Summarize how both qualitative and quantitative evidence are important in Snow's study.

4b. Identify the implications for multimethod research that can be drawn from this example.

5. Is Snow on Cholera, Like Brady on the 2000 Election, a Least-Likely Case?

5a. As noted above, Brady argues that his analysis of the 2000 presidential election—given that it is based on large-N, quantitative data—is a least-likely case for showing the importance of qualitative evidence and reasoning. He sees his analysis as a particularly telling demonstration that this method is indeed valuable. In parallel, consider the argument that because qualitative evidence and reasoning are likewise important in Snow's quantitative analysis of 10,000 households, it also makes Freedman's example a least-likely case that provides especially strong support for the claim that systematic qualitative analysis is important.

EXERCISE 10. ROGOWSKI ON STRONG THEORY

Rogowski, Ronald. 2010. "How Inference in the Social (but Not the Physical) Sciences Neglects Theoretical Anomaly." In Henry E. Brady and David Collier, eds., *Rethinking Social Inquiry*, 2nd ed. Lanham, MD: Rowman and Littlefield.

Introduction. Rogowski underscores the perspective emphasized throughout the exercises—the concern with prior theoretical expectations and how they can sharpen the focus on specific diagnostic evidence that moves the analysis forward. In his examples, the studies that overturn major prior hypotheses are Lijphart's analysis of the Netherlands, Allen's case study on the rise of Nazism, Gourevitch's critique of claims about the role of core states advanced by world systems theory, Katzenstein's investigation of small states in world markets, and Bates's examination of failed economic growth in Africa. Like Freedman (2011, 233 and passim), Rogowski emphasizes the value of looking for anomalies that may come into focus because rival explanations are carefully formulated.

Questions on Rogowski

1. Strong Theory.

1a. Identify the bodies of prior knowledge that frame the studies Rogowski considers.

2. Overturning Arguments with a Single Observation.

2a. According to Rogowski, if the researcher uses strong theory that yields precise predictions, then observations from a single case can decisively overturn a prior line of argument. Summarize your assessment of whether, given the information Rogowski provides, you are as convinced as he is that these studies justify such strong conclusions.

2b. Zaks (2011) argues that particularly strong tests of hypotheses are possible if the hypotheses are mutually exclusive, rather than coincident or congruent. Discuss whether, in Rogowski's examples, the tests are strong specifically because the hypotheses are mutually exclusive. Thus, might the tests he considers be decisive due not only to strong theory, but because the theory specifies a particular type of hypothesis? If this is true, how does it affect Rogowski's overall argument?

3. Eddington's Test of Einstein's Theory. Rogowski discusses the famous 1919 test of Einstein's Theory of Relativity. Based on celestial observations made from Brazil and West Africa, Eddington found that the magnitude of deflection of light from stars during a solar eclipse corresponded to the theory's prediction. This observational (not experimental) study played an important role in the wide acceptance of Einstein's theory.⁹

3a. Evaluate whether this test is a case study, a quantitative analysis, or both.

3b. Consider whether this physical science example is helpful in bolstering Rogowski's argument.

4. Contribution of Case Studies. Rogowski summarizes King, Keohane, and Verba's (1994, hereafter KKV) bruising critique of case studies, a critique to which he takes strong exception. Rogowski observes:

KKV contends that "in general...the single observation is not a useful technique for testing hypotheses or theories" [quoted from KKV, p. 211], chiefly because measurement error may yield a false negative, omitted variables may yield an unpredicted result, or social-scientific theories are insufficiently precise. (Rogowski 2010, 93)

Rogowski (93) pointedly concludes that KKV are thereby arguing that these studies by Lijphart, Allen, and Gourevitch are "bad science."

4a. Evaluate KKV's position. Note their implicit premise that *quantitative* studies can, in fact, avoid these flaws. Juxtapose this premise with, for example, Bartels's (2010) view of measurement error in quantitative research and Seawright's (2010) discussion of problems such as omitted variables in regression studies. What balance would you strike?

EXERCISE 11. SHERLOCK HOLMES: A MASTER OF PROCESS TRACING?

Conan Doyle, Arthur. "The Adventure of Silver Blaze." Originally published in *Strand Magazine* Vol. 4 (December 24, 1892): 645–60. In Doyle (1960) it is on pp 335–50. A searchable copy of the story accompanies this set of exercises.

Introduction. The Sherlock Holmes story "Silver Blaze" is rich in examples of process-tracing. A number have been closely examined by Collier (2011), but many others also merit attention. Collier's discussion focuses primarily on explaining Straker's murder, but explaining the disappearance and whereabouts of the horse is also an important puzzle.

Questions on Sherlock Holmes

1. Hypotheses, Clues, and Inferences.

1a. Tables 3 to 7 in Collier (2011) present a partial inventory of hypotheses, clues, and inferences in the "Silver Blaze" story. Examine these tables and the corresponding parts of the story, and evaluate Collier's analysis. Might you have formulated any of the hypotheses in a distinct way, selected different clues, and/or made different inferences?

1b. Prepare an inventory of further examples, in addition to those in Collier's tables 3 to 7, following the same format as his tables. You may wish to focus on explaining either Straker's murder or the disappearance of the horse.

2. What Kinds of Prior Knowledge? In dozens of Sherlock Holmes stories, the detective draws on a remarkable range of prior knowledge. In this particular story, for example, he uses knowledge of the receipts that people are likely to carry in their pockets, the sociability of horses, the behavior of dogs, the characteristics of surgical knives, the actions of race horse owners who are prone to cheat, and the defensive tactics of Gypsies. Identify additional pieces of general information that Holmes utilizes in "Silver Blaze." Where does this information fit in the four categories of background knowledge discussed by Collier (2011, 833)?

3. Holmes as a Master of Process Tracing? Discuss other details in the story that give insight into Holmes's reasoning. Consider how the prior knowledge discussed in Question 2 helps him arrive at his insights. Relatedly, does the information provided in the narrative reveal the sequence in which he gains these insights?

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NOTES

- 1 Collier (2011, note 3) cites the substantial literature that has discussed and developed this method.
- 2 To underscore an obvious but crucial point: It is productive to refer to descriptive inference, and not just description, given the challenge of moving from particular pieces of data to the wider concept that one wishes to "describe." In the Tannenwald study below, for example, adequately describing the nuclear taboo that she posits requires complex inferences from particular items of information to the broader idea.
- 3 For a caveat regarding Lerner's study, see Collier 2011, note 12.
- 4 Drawing on a larger data set, the book focuses on 1,600 respondents in six Middle Eastern countries.
- 5 As noted, analysis of this village is embedded in a large-N survey, and Lerner's study is therefore not, overall, based on process tracing. Rather, the point here is that examining Lerner's highly detailed information on the village provides excellent practice for the descriptive component of process tracing. The same could be said about the Fenno example. In Fenno's other studies, the insights drawn out of "soaking and poking" are analyzed in diverse ways other than process tracing.
- 6 As Lerner puts it, "to simplify the matter," this is "the capacity to see oneself in the other fellow's situation." It involves "a high capacity for rearranging the self-system on short notice" (50, 51).
- 7 Like Freedman in the exercise below, Brady organizes his discussion around the idea of causal-process observations (CPOs). As already noted, CPOs are a foundation of process tracing. Brady's analysis (and also Freedman's) is therefore treated here as an illustration of that method.
- 8 Eckstein (1975, 113–23) provides a benchmark discussion of crucial-case analysis and specifically least-likely cases.
- 9 See, for example, note 4 Rogowski (90). Although this test was crucial for the broad acceptance of Einstein's theory, it was several decades before adequate measurements yielded a fully valid test.

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