Process Tracing in Case Study Research
• Examples
• Process Tracing in a Nutshell
• General Theory of Process Tracing
• Generating and Assessing Hypotheses
• Process Tracing in Case Study Research
• Helpful Hints
Process Tracing In a Nutshell

- A way of building and testing theories in qualitative research by exhaustive examination of sequential data
- Encourages equal prioritization of multiple hypotheses until proven false by contradictory data
- Similar to historical narrative, but with an analytical twist
- Collected data is broken into sets of relevant events that constitute the “process of interest”
- Each of these events needs to be explainable by a more generalizable principle (i.e. conform to theory)
- Reduces spurious correlation by demanding the researcher identify an “uninterrupted causal path” between hypothesized causes and observed outcomes
Example: Dominoes

• Interesting outcome observed $\rightarrow$ desire to determine causal mechanism

• Condition of equifinality (different processes leading to the same end result) $\rightarrow$ multiple theories of causation

• Additional data examined (for sequential coherence) $\rightarrow$ validation/elimination of possible theories

• Possible generation of new theories

Bennett and George (1997)
Process Tracing: General Theory

- A way of establishing relationships of causality in case study research (or comparative research with a small number of cases)

- Links **Outcomes** (dependent variables) with **Explanations** (independent variables) via **Causal Mechanisms** (intervening variables)

- Tests *and* Generates Hypotheses

- Assumes complexity (e.g., “multiple causality, feedback loops, path dependencies, tipping points, and complex interaction effects”)

Collier (2010); Falleti (2006)
Basic Building Blocks

• *Causal-process observations* (CPOs)
  – clues, pieces of evidence, collected data

• Hypotheses
  – Independent variables
  – Causal mechanisms

• *Causal sequence framework*
  – Tests of causation that relate hypotheses and variables

Collier (2010)
Process tracing “requires the researcher to tap into her sociological or political imagination in order to identify the theories relevant to the problems and puzzles she seeks to explain, and to be able to derive feasible causal mechanisms” (Falleti 2006)

Useful Metaphors:
“Theory-guided Process Tracing”

• Identify possible theories

• Predict observable patterns
  – If theory is true, and
  – If theory is false

• Collect observations (“as many and diverse as possible”)

• Inspect observations for consistency with predictions

• Identify probable causal mechanisms; discard unsupported theories

Hall 2003; Falleti 2006
**Outcome**
(dependent variable)

**Auxiliary outcomes**
(correlative outcomes/marker of the process leading to core outcome)

**Causal Mechanisms**

**Intervening Variables**

**Theory Verification**

**Theory Generation**

**Alternative Explanations**
(independent variables)
Generating Hypotheses

• Identify the **start** and **end** of the sequence of events

• Hypotheses can arise from:
  – Academic Theories
  – Local/Area Expertise
  – Participant Explanations

• “Case study research should in general err on the side of including too many theories and variables rather than too few” (Bennett and George 1997)

• Process tracing itself can generate new hypotheses inductively
Testing Hypotheses

• Hypotheses should be as “brittle” as possible (Hall 2003)
• Causal paths should be uninterrupted
• Unexpected inconsistencies can generate competing hypotheses
• Hypotheses must be both necessary and sufficient to establish a causal connection
• Multiple valid causal mechanisms may exist after analysis
• Conclusions can be provisional
also calling them "clues." CPOs are the specific pieces of data on which the researcher focuses in process tracing. With regard to causal inference, they provide leverage for adjudicating among alternative hypotheses. In addition, as already noted, close examination of CPOs is a key tool for descriptive inference. With the idea of CPOs, we maintain that the data of qualitative research deserves a status parallel to that of data-set observations (DSOs), which are the information contained in the standard data set of quantitative researchers.

The causal sequence framework situates the arguments evaluated in process-tracing tests in relation to standard hypotheses and variables discussed in causal inference. Thus, one asks, what are the hypothesized independent variables, the dependent variable, and the mechanisms (which may also be called intervening variables) that may connect them? Recognizing the place of the tests in this framework further clarifies the contribution of process-tracing to causal inference.

3. Process Tracing

Basic ideas about process tracing can be summarized in terms of four empirical tests, which evaluate evidence in distinct ways. The tests are classified based on two criteria: whether passing the test is necessary for establishing a causal connection, and whether it is sufficient for establishing a causal connection. These criteria in turn group the tests regarding the implication for rival hypotheses. Based on these criteria, the typology in Table 1 situates four possible tests: straw-in-the-wind, hoop, smoking gun, and doubly decisive.

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**Table 1. Process Tracing: Types of Tests**

<table>
<thead>
<tr>
<th></th>
<th>Sufficient to Establish Causation</th>
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<tbody>
<tr>
<td></td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>1. Straw in the Wind Test</td>
<td><em>Passing:</em> Affirms relevance of hypothesis, but does not confirm it</td>
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<tr>
<td></td>
<td><em>Failing:</em> Suggests hypothesis not relevant, but does not eliminate it</td>
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<td></td>
<td><em>Implication for rival hypotheses:</em> None</td>
</tr>
<tr>
<td>2. Hoop Test</td>
<td><em>Passing:</em> Affirms relevance of hypothesis but does not confirm it</td>
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<tr>
<td></td>
<td><em>Failing:</em> Eliminates it</td>
</tr>
<tr>
<td></td>
<td><em>Implication for rival hypotheses:</em> None</td>
</tr>
<tr>
<td>3. Smoking Gun Test</td>
<td><em>Passing:</em> Confirms hypothesis</td>
</tr>
<tr>
<td></td>
<td><em>Failing:</em> Does not eliminate it</td>
</tr>
<tr>
<td></td>
<td><em>Implication for rival hypotheses:</em> None</td>
</tr>
<tr>
<td>4. Doubly Decisive Test</td>
<td><em>Passing:</em> Confirms hypothesis and eliminates others</td>
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<td></td>
<td><em>Failing:</em> Falls short in establishing sufficiency and/or necessity</td>
</tr>
<tr>
<td></td>
<td><em>Implication for rival hypotheses:</em> passing eliminates them, as noted above</td>
</tr>
</tbody>
</table>

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1 This table is adapted from Bennett (2010: 210). It builds on categories initially formulated by Van Evera (1997: 31–32).

2 In this table, “establish causation,” as well as “confirming” or “eliminating” a hypothesis, obviously does not involve a definitive test. Rather, as with any causal inference, qualitative or quantitative, it is a plausible test in the framework of a particular data set and of this specific method of inference.
Process Tracing in Case Study Research

• “Applicable to any hypothesized causal process” (Bennett and George 1997)

• Helpful for:
  – Individual and organizational behavior
  – Complex causal relationships
  – Imperfectly comparable cases
  – Deviant cases (outcomes not predicted by theory)
Helpful Hints

• Make a flowchart
  – Expected magnitude and sign of expected effect
  – Nature of the relationship (linear, non-linear, additive, etc.)
  – Interaction effects, delayed linkages, possible pre-emptive / expectational behaviors, and suspected equifinality (mechanisms with the same end result)

• Process testing can be done forwards or backwards (i.e. from causes -> outcomes or from outcomes -> causes) or both

Bennett and George (1997)
“To be successful, social science must steer a careful course between the Scylla of lovely but untested theory and Charybdis, the maelstrom of information unstructured by theory”

Barbara Geddes (2003)