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Process tracing of extensive and intensive processes

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ABSTRACT

This essay briefly analyzes the introduction of process tracing to the political science and political economy methodological toolkit. It then proposes a theory-guided variant of process tracing and distinguishes between its application in extensive and intensive type of processes. It argues that the comparative advantage of process tracing vis-à-vis other social sciences research methods lies in its potential to uncover the causal mechanisms that link the constitutive events of intensive type of processes. It shows that theory-guided process tracing of intensive processes can be successfully applied to illustrate, test and produce theory.

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The method of process tracing has been applied in the human and social sciences for at least four decades, but it is only in the recent past that political scientists have adopted it as part of their methodological toolkit (Kittel and Kuehn 2013: 2). Since the 1970s, cognitive psychologists employed process tracing techniques to study the information processing strategies that underlie individuals' choices. Experimental designs were used to extract a person's cognitive rules from verbal protocols (Payne 1976), information display boards (Eihorn *et al.* 1979: 470–1) or eye movements (Russo and Rosen 1975). Among other novelties, the early application of these process tracing techniques permitted cognitive psychologists to analyze the sequential chains of decision-making rules and their feedback or interactive effects within the process of decision-making, rather than solely focusing on the input/output relationship of a choice, as it had been done in prior linear or additive models of decision-making (Larcker and Lessig 1983: 59).

In the late 1970s and the 1980s, sociologists and historians studying macro-level phenomena also proposed the incorporation of historical narratives within highly abstract social science theories to better explain social and political outcomes (Skocpol 1984, Tilly 1984). Within this tradition, comparative historical analyses – out of which the method of process tracing would stem – combined historical descriptions with sociological theories in order to temporally analyze the macro-causes of macro-level historical processes (for example, Skocpol 1979, Hall 1986).

Albeit different in their epistemology, techniques and research goals, both the cognitive psychology and the historical sociology strands of process tracing have emphasized the utility of the method to uncover causal mechanisms or to open the 'black box' of causation that connects inputs and outputs, independently of whether these causal mechanisms or intervening variables are rooted in individuals' cognition or in the workings of social structures and collective actors.

In this essay, I briefly analyze the introduction of process tracing to the political science and political economy methodological toolkit. I then propose a theory-guided variant of process tracing and distinguish between its application in what I call extensive and intensive type of processes. I argue

that the comparative advantage of process tracing vis-à-vis other social research methods lies in its potential to uncover the causal mechanisms that link the constitutive events in the intensive type of processes.

Process tracing in political science

In political science, one of the earliest explicit definitions of process tracing was provided by George and McKeown (1985), who defined it as a method of within-case analysis to evaluate causal processes.¹ According to them, this method does not solely rely on the comparison of variations across variables in each case, but also 'investigate[s] and explain[s] the *decision process* by which various initial conditions are translated into outcomes' (1985: 35, emphasis added). More concretely, and drawing from the cognitive psychology applications of the method at the time, the authors argue that the process tracing method attempts to uncover the stimuli the actors attend to in the decision process and the actual behavior that then occurs (George and McKeown 1985). According to this definition, the method of process tracing is deeply rooted in the tradition of methodological individualism as it attempts to uncover the microfoundations of individual behavior that connect hypothesized causes and outcomes.

Twenty years later, in a book that brought process tracing to the center stage of political science, George and Bennett (2005) dedicated a chapter (Chapter 10) to this method, which they defined as the 'method [that] 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' (2005: 206). According to the authors, the main ontological difference between the statistical method and the method of process tracing is that while the former attempts to define *causal effects* (that is the expected value of the change in outcome when one or more independent variables change), the latter identifies the *causal mechanisms* that connect causes and effects. Moreover, the authors define causal mechanisms as 'ultimately unobservable physical, social, or psychological processes through which agents with causal capacities operate, but only in specific contexts or conditions, to transfer energy, information, or matter to other entities' (2005: 137). To the extent that these agents do not need to be individuals, this definition of process tracing allows for the identification of causal mechanisms that need not be rooted at the individual level (in the way that George and McKeown's (1985) definition of process tracing had done). But more importantly from the perspective of this essay, George and Bennett define causal mechanisms as *transformative processes*, an idea to which I shall return when analyzing intensive processes.

Other variants of process tracing can be identified in the political science literature, such as 'analytic narratives' (Bates *et al.* 1998), 'historical narratives' (Büthe 2002) or 'systematic process analysis' (Hall 2003, 2006), which I have analyzed elsewhere (Falletti 2006), and more recently the process tracing of 'causal process observations' (Collier *et al.* 2010, Collier 2011).² It is worth noting that a key difference among these variants of process tracing lies in their conceptualization of the relationship between theory and method. In the *Analytic Narratives* project of Bates and collaborators (1998), process tracing provides an edge to understanding actors' preferences, expectations and strategies, which could not be elucidated through the application of other methodologies. Yet, the function of the method is to *illustrate* how the theory works in the real world rather than to generate (or perhaps even test) theories. According to Büthe (2002, see also Büthe's contribution to this Symposium), process tracing is more appropriate than other methods in the study of phenomena characterized by complex causality or multiple causal pathways. However, Büthe argues that, as a method, process tracing can only present us with plausible explanations, and cannot rule out alternative theories: it can *generate* but not test theories. Perhaps for this reason, in this symposium Büthe explores the advantages of process tracing when used in conjunction with other methods such as statistical analysis, in multi-method research designs. Hall (2003, 2006), in contrast, maintains that his variant of process tracing (systematic process analysis) is an epistemologically superior method to others in the social sciences, because it can map the ontological complexity of the social world and rule out

competing theories. This is to say, according to Hall, process tracing can test theories. This is also the case made by Beach and Kreuzer in this symposium. Similarly, in the more recent ‘causal process observations’ approach of David Collier (2011) and with collaborators (2010), the process tracing method, applied in a deductive manner and through a series of evidence tests, can rule out or corroborate the existence of necessary and/or sufficient conditions that mediate between a hypothesized cause and the effect. In the four approaches just described, the method of process tracing is employed to performed one primordial task, whether to illustrate (in the case of analytic narratives), generate theory (in the case of Büthe’s approach to historical analysis and causal process tracing) or test previously proposed hypotheses and theories (as in the approaches of Hall and of Collier and collaborators or Kreuzer and Beach in this symposium). I will argue that the theory-guided variant of the process tracing method that I will articulate below (see also Falletti 2006) has the potential to fulfill all three tasks simultaneously: illustrate, generate and (when used in combination with the comparative method) test theories.

The theory-guided variant of process tracing

Two decades ago, sociologist Aminzade (1993) provided one of the most succinct and illuminating definitions of what I call the theory-guided process tracing (TGPT) method.³ According to Aminzade, the researcher has to provide ‘theoretically explicit narratives that carefully trace and compare the sequences of events constituting the process’ of interest (1993: 108). Narratives, he writes,

allow us to capture the unfolding of social action over time in a manner sensitive to the order in which events occur. By making the theories that underpin our narratives more explicit, we avoid the danger of burying our explanatory principles in engaging stories. By comparing sequences, we can determine whether there are typical sequences across [cases] ... and can explore the causes and consequences of different sequence patterns. (Aminzade 1993, my emphasis)

Aminzade’s explanation of theoretically explicit narratives is beautiful in its simplicity and wide applicability. Drawing from Aminzade, I define the method of theory-guided process tracing (henceforth, TGPT) as the temporal and causal analysis of the sequences of events that constitute the process of interest. Such process must be clearly conceptualized, both theoretically and operationally, with reference to previous theories. The TGPT method assumes that in these temporal sequences of events, their order is causally consequential.

Regarding the definition of TGPT, two further specifications are in order. First, while single-sequence TGPT analysis is possible (as proposed by George and McKeown (1985), for instance), in order to test hypotheses, the TGPT method is most powerful when combined with the comparative method. For example, the comparative application of the TGPT method permits the researcher to identify different patterns of sequences and their related causes and consequences, just as Aminzade wrote of theoretically explicit narratives. Second, while the other variants of process tracing discussed in this symposium do presuppose theory guidance (see Beach as well as Kreuzer in this symposium), the method proposed here is not solely applied to illustrate or to test a theory with confirming evidence (as in the case of process tracing tests). Theory generation is an important result of the application of the TGPT method. In this regard, TGPT approximates the inductive type of process tracing described by Trampusch and Palier in their Introduction to this Symposium. As they eloquently write:

inductive analysis of processes does not merely consist of naïve observations of empirical events from which theoretical ideas are derived, but rather forms a theoretically informed analysis (= decomposition) of processes that is looking for causal chains between the observed events.

This is the way in which the variant proposed here is theory-guided. It is not theory-guided for the testing of hypotheses with pieces of evidence (such as in the deductive type of process tracing). Instead, it is guided by theory (and the researcher’s ontology about how the social world works) to identify the relevant events that constitute the sequence or process of interest.

Collier and Collier's (1991) landmark book on the different patterns of working class incorporation and their effects on political regimes constitutes an excellent example of the type of scholarly work and research design I identify with the TGPT method. The authors analyze the political developments of eight Latin American countries along four paired comparisons. Countries with similar types of incorporation of labor are paired together. At the same time, major socioeconomic differences between the countries of each pair allow the authors to control for one of the alternative explanations (the impact of socioeconomic change). The cases' narratives constitute examples of TGPT in that structured comparisons are organized around four theoretically constructed and temporally sequential crucial periods: reform, incorporation, aftermath and heritage. The systematic causal and temporal analysis shows that varying patterns of institutionalization of the conflicts among social classes and the state in the early stages of the incorporation period had significant effects on the features of the political parties, their links to unions and the political regimes of the later periods.

In my view, the TGPT method has several advantages over alternative conceptualizations of process tracing. First, and unlike the analytic narrative approach, it accounts for endogenously generated or modified preferences. Wood's (2000) study of democratization in El Salvador and South Africa provides an excellent example of how protracted civil conflict can produce structural changes in the economy that fundamentally alter the order of preferences of bargaining social actors. She uncovers the mediating causal mechanisms through theory and ethnographic fieldwork. Second, the TGPT method can also incorporate feedback effects, as in the analysis of path dependent sequences of events that systematically reinforce (or weaken) the impact of the originating cause over time, as in Huber and Stephens (2001) analysis of the reinforcement of the welfare state through policy ratchet effects. Third, TGPT allows us to adjudicate among competing theories, such as in the exemplary work of Collier and Collier (1991) analyzed above. Finally, the TGPT variant of process tracing allows to inductively generate theory by carefully uncovering the causal mechanisms that connect causes and effects.

TGPT of extensive and intensive processes

The uncovering of causal mechanisms through the TGPT method highlights the distinction between two types of causal and temporal processes, *extensive* and *intensive*. Extensive processes include the cause and outcome of interest and the mediating intervening variables. Intensive processes, on the other hand, mediate between a putative cause and the outcome of interest but do not include the triggering cause or the outcome (see Figure 1).

Extensive processes are those that connect cause and outcome through one or more intervening variables. The process tracing starts with the cause and moves toward the outcome, while looking (or testing) for the (hypothesized) intervening steps. TGPT of extensive processes is thus associated with research designs that in the words of Scharpf (1997: 24) are 'forward-looking' or to the process tracing of 'causal process observations' as described by Collier *et al.* (2010).

Rueschemeyer *et al.* (1992) constitutes an example of what I would call extensive process tracing. The authors argue that industrialization (cause) leads to democratization (effect) through the

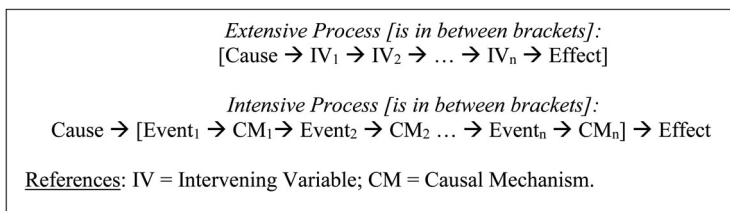


Figure 1. TGPT of extensive and intensive processes.

mobilization of organized urban labor (intervening variable). TGPT in this case starts with the changes brought about by industrialization and continues with a thorough examination of the process of labor mobilization, which in turn leads to the events that confer voting rights to a majority of the male population. In extensive processes such as this one, the putative cause and effect usually refer to complex social or political processes (industrialization and democratization in this example) that can be broken down in their multiple constitutive events. However, TGPT of extensive processes identifies the events that are theoretically relevant given the hypothesized connecting intervening variables. For instance, rather than considering all the economic and technological events that might be part of industrialization, Rueschemeyer, Stephens and Stephens need only point to those that increase the likelihood of mobilizing organized labor, such as urbanization. And while democratization is also a multifaceted process, the authors need only take into consideration the event that extends suffrage to at least half of the male population, and thus ends the periodization of the extensive process.⁴

On the other hand, *intensive processes* are triggered *after* a cause and end *before* the outcome of interest. This is to say, intensive processes take place between cause and effect and do not include them. Intensive processes are conceptually and tightly connected sequences of events that are consequential for the outcome of interest. These series of events belong to one underlying transformative process that transforms the unit of analysis (examples of such processes are decentralization, where the unit of analysis is the state; democratization, where the unit of analysis is the political regime; (de)regulation, where the unit of analysis is trade or industrial policies (among other possible policy realms); flexibilization, where the unit of analysis is labor policies, just to name a few examples of transformative processes). Intensive processes are therefore the transformative sequences of events that originate after the initial cause and yield the effect of interest.⁵ TGPT of intensive processes is related to the research designs that Scharpf (1997: 25) identified as backward-looking. The researcher moves backward from the effect to the cause, and then, I add, zooms in the temporal and causal analysis of the mediating and transformative intensive process that accounts for the effect.

In doing TGPT of intensive processes, the researcher does not include the analysis of the cause, other than considering it as an initial trigger. The researcher does not need to include the effect of the intensive process either.⁶ Instead, the researcher will focus on the sequencing of events of the mediating transformative process. In my research on decentralization (Falleti 2005, 2010), for example, I found that the type of territorial interests dominant in the coalition that brings about neoliberal decentralization accounts for the first type of reform (political, administrative or fiscal). Nonetheless, it is effect of the early decentralization reform on the subsequent coalition that explains the type and contents of the decentralization reform that follows, which in turn affects future coalitions and further reforms. In the end, it is the overall sequential pattern of decentralization events, their linking causal mechanisms (learning, incrementalism, reproduction of power and so on) and their temporal effects that explain the degree of change in the intergovernmental balance of power among presidents, governors and mayors. This is to say, decentralization is an intensive process that transforms the state and that mediates between the originating territorial coalition and the intergovernmental balance of power. In this example, it is not enough to look at the originating territorial coalition or the first decentralization event. Instead, we must study the sequence of events as they unfold overtime, their connecting causal mechanism and their temporal effects to account for the outcome of interest.

At this point, three clarifications are in order. First, the *extensive* and *intensive* terminology refers exclusively to whether the originating cause and the final effect are included as part of the process to be traced. The distinction does not refer to issues of complex causality, which might characterize both types of processes. Second, it is not the number of intervening steps or events that distinguish extensive from intensive processes. Instead, the ontological quality of the intervening steps is different. In extensive processes, the intervening steps are closer to the notion of intervening variables, and we can often straightforwardly record their presence or absence. In intensive processes, the causal mechanisms connecting the events of the sequence or underlying process

explain the *how* of causation.⁷ Finally, TGPT of extensive process is more likely to be used to test hypotheses or theories, whereas TGPT of intensive processes is more likely to inductively generate theory. In my opinion, the greatest potential and comparative advantage of process tracing as a social science method lies in the analysis of intensive processes in order to uncover causal mechanisms. If the intervening steps of a process tracing explanation can be translated into intervening variables (as in the TGPT analysis of extensive processes), which could be straightforwardly operationalized and measured, other social research methods (such as statistics) could be applied and lead to more generalizable conclusions.

Yet, whether analyzing extensive or intensive processes, in linking the start and the end of the process, the researcher who applies the TGPT method has to construct an explicit sequence of intervening variables or events (and causal mechanisms) constitutive of the process of interest. This is not a simple task. In extensive processes, it requires specifying relevant initial causal factors and the intervening variables that connect them to outcomes. In the case of intensive processes, it entails a crystal clear conceptualization of the mediating process of interest and its component events, such that they can be properly identified across analytically comparable contexts. Hence, profound knowledge of the competing theories that seek to account for the research problem as well as deep familiarity with the analyzed cases are necessary for the successful deployment of TGPT. In other words, the researcher must tap into her sociological and political imagination in order to specify the significant steps or events of the process of interest, identify relevant theories, derive intervening variables and infer causal mechanisms.

Conclusion

The debates on the relationship between historical narratives and theoretical explanations, and between the specificity of historical events and the generalizations of law-like propositions span several decades and various disciplines. At present, as we stress in the social sciences the importance of medium-range theories that take context and complex causality seriously, the method of process tracing holds significant promise to identify the intervening variables or the events and causal mechanisms that connect causes to outcome. In temporal sequences of events, I have argued, TGPT of intensive processes can be successfully applied to illustrate, test and produce theory.

Notes

1. See the Introduction to this Symposium by Trampusch and Palier for other early definitions of process tracing in the field of political science.
2. See Tables 1 and 2 in Trampusch and Palier's Introduction to this Symposium for an extensive and exhaustive list of definitions of process tracing and its different variants in the political science literature.
3. I am indebted to Michael Coppedge for having suggested this label when he invited me to write an essay on process tracing for the APSA Comparative Politics Newsletter (Falletti 2006).
4. For an alternative approach to the study of democratization as the succession of tightly linked expansion of suffrage events, which is along the lines of my definition of intensive process, see Caraway (2004: 455).
5. Causal complexity and causal interactions could entail that more than one mediating intensive process explains our outcome of interest. Even in those cases, the TGPT method could be applied to the multiple intensive processes that account for our outcome. For more on the definitions of events, sequences and conjunctural processes, see Falletti and Mahoney (2015).
6. The researcher will of course have to clearly define and measure the outcome of interest.
7. Some scholars equate causal mechanisms with intervening variables. In my view, this is a reductionist definition of causal mechanisms. It reduces the causal mechanism to an attribute of the object of study. In my opinion, and as defined by George and Bennett (2005), causal mechanisms should specify the transformative process connecting cause and effect or, as elaborated elsewhere, explain the *how* of causation (see Falletti and Lynch 2008, 2009). As transformative processes, causal mechanisms are of a higher level of abstraction than intervening variables. Moreover, because they identify the relationships connecting causes and effects, they are portable concepts: they can travel to other contexts within the theoretical domain of reference (Geddes 2003: 152). Examples of the causal mechanisms that are consistent with this definition are 'learning', 'competition' (Pierson 2004: 40–1, 124–9), 'institutional

conversion' and 'institutional layering' (Thelen 2004: 35–7), to name a few. For more on this definition and examples of causal mechanisms, see Falletti and Lynch (2008, 2009).

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Notes on contributor

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