What is process tracing actually tracing?
The three variants of process tracing methods and their uses and limitations

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1. Introduction

Process tracing (PT) is arguably the political science method that best allows us to study causal mechanisms, and therefore represents an ‘...invaluable method that should be included in every researcher’s repertoire.’ (George and Bennett 2005:224). PT methods have experienced a surge in popularity within qualitative political science in recent years, with numerous Ph.D. students and established scholars attempting to use PT methods in their research (e.g. Bennett and Elman 2006; Hall, 2008; Lehtonen 2008; Jacobs 2004; Elman 2004; Owen 1994; Khong, 1992).

Yet despite the widespread use of PT in empirical research and an increasing body of methodological literature on PT and causal mechanisms, there has been little progression in the development of PT methodology. While scholars generally agree that PT can be defined by its ambition to trace causal mechanisms (Bennett, 2008a, 2008b; Checkel, 2008; George and Bennett, 2005), there is considerable confusion in the literature about how PT should be used in practice. What types of causal mechanisms is PT actually tracing? To what degree can PT case studies be nested in broader, mixed-methods research designs? The resulting lack of concrete guidelines and a coherent framework has prevented the method from fulfilling its potential of enabling us to open up the ‘black box’ of causality using small-n case study methods.

This confusion is partly the product of defining PT as a single research method. We argue that a lot of the murkiness about what PT actually is and how it should be used in practice can be cleared up by differentiating PT methodology into three distinct variants. In our opinion there are three clearly identifiable variants of PT: theory-testing, theory-building, and explaining outcomes.

Theory-testing PT deduces a theory from the existing literature and then tests whether there is evidence that a hypothesized causal mechanism is actually present in a given case. This variant reflects the methodological prescriptions put forward by scholars such as Bennett and Checkel, among others (see below). In theory-testing PT, the case study tests whether the observable implications of the existence of a more general, parsimonious theorized causal mechanism are present or not. As a more general causal mechanism is being traced in the case study, theory tests can be nested within mixed-methods designs.

Theory-building PT has the ambition is to build a theoretical explanation from the
empirical evidence of a particular case, inferring that a more general causal mechanism exists from the ‘facts’ of the case. While analytically very useful, there exist to our knowledge no guidelines in the literature for how this type of PT should proceed.

Finally, explaining outcome PT are studies that attempt to craft a minimally sufficient explanation of a historical outcome in a specific case, such as why the US decided to go to war against Iraq in 2003. Here the aim is not to build or test more general theories; instead the ambition is to craft a (minimally) sufficient explanation of the case. This reflects the case-centric ambitions of many qualitative scholars who use case study methods, and is reflected in the burgeoning literature on topics such as eclectic theorization (where the case is upfront and center) (Sil and Katzenstein, 2010) and pragmatism as a research strategy (Friedrichs and Kratochwill, 2009). In explaining outcome PT, theoretical causal mechanisms are employed in eclectic combinations, and the analysis often incorporates what can be termed non-systematic, case-specific mechanisms to craft a sufficient explanation of a particular historical outcome. Explaining outcome PT cannot be nested in mixed-methods designs. For example, the use of eclectic combinations of theories creates what are in essence case-specific combinations, and therefore are non-parsimonious conglomerates that cannot be exported to other cases.

The paper is structured into three parts. First we briefly introduce the existing orthodoxy regarding how PT methods are defined. This is followed by a presentation of the three variants of PT, focusing on their differing analytical purposes, what each variant is tracing in practice, and the degree to which the variants can be nested in mixed-method designs. Exemplary studies of each variant are used to illustrate the key differences across the variants. The paper concludes by summarizes the commonalities and differences across the three variants of PT.
2. One method?

PT is a distinct method in comparison to regression-based analysis or qualitative comparative methods. PT involves research where, ‘the cause-effect link that connects independent variable and outcome is unwrapped and divided into smaller steps; then the investigator looks for observable evidence of each step.’ (Van Evera 1997:64). Gerring suggests that ‘if well constructed’, it ‘...may allow one to peer into the box of causality to locate the intermediate factors lying between some structural cause and its purported effect’ (Gerring 007:45).

PT in political science is often defined by the ambition to trace causal mechanisms (Bennett, 2008a, 2008b; Checkel, 2008; George and Bennett, 2005). Studying causal mechanisms in qualitative in-depth single case studies using PT enables the researcher to make strong within-case inferences about how outcomes come about, updating the level of confidence we have in the validity of theorized causal mechanism.\(^1\)

Causal mechanisms can be defined as, ‘...a complex system, which produces an outcome by the interaction of a number of parts.’ (Glennan, 1996:52). Studying causal mechanisms in qualitative in-depth single case studies using PT enables the researcher to make strong within-case inferences about how outcomes come about, updating the level of confidence we have in the validity of theorized causal mechanism. PT 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 2005:206-207). PT therefore holds a great potential for making causal inference in single cases (within-case inferences) and allows us to study causal mechanisms in social science.

However, PT has mostly been treated as one method in the case study method literature. The treatment of PT as a single method has led to the relatively murky methodological guidelines on how we should design PT designs and how the methodological tools can be applied.

George and Bennett (2005) in their presentation of PT acknowledge the range of

\(^1\) Despite being heavily debated in the philosophy of social science, we are agnostic about whether mechanisms are best understood as being at the micro/actor-level, the macro/structural level, or whether they can span different levels (Hedström and Swedberg, 1998; Mayntz, 2004; McAdam, Tarrow and Tilly, 2001; Hedström and Yliski, 2010).
different forms of PT. They argue that PT ranges from detailed narratives over more explicit use of theory, where ‘...at least parts of the narrative are accompanied with explicit causal hypotheses highly specific to the case without, however, employing theoretical variables for this purpose or attempting to extrapolate the case’s explanation into a generalization.’ (George and Bennett, 2005: 210-211), to varieties of PT where ‘the investigator constructs a general explanation rather than a detailed tracing of a causal process’ (Ibid, p. 211). Yet in the rest of their chapter on PT they treat the method itself as a singular method, albeit with different uses. These include testing theories to check for spuriousness and assess equifinality, to building theories, in particular using deviant cases.

Other recent accounts treat PT more explicitly as a single method, often defining PT as a deductive tool to test whether causal mechanisms are present and function as theorized. For example Gerring (2007) describes a two-stage deductive research process where the analyst first clarifies the theoretical argument, followed by the empirical verification of each stage of this model. Checkel describes PT as the attempt to, ‘...trace the process in a very specific, theoretically informed way. The researcher looks for a series of theoretically predicted intermediate steps.’ (Checkel, 2008: 363). The end result is a middle-range theory.

Bennett (2010) describes PT as a method that involves, ‘...the examination of “diagnostic” pieces of evidence within a case that contribute to supporting or overturning alternative explanatory hypotheses. A central concern is with sequences and mechanisms in the unfolding of hypothesized causal processes. The research looks for the observable implications of hypothesized explanations...The goal is to establish whether the events or processes within the case fit those predicted by alternative explanations.’ (Bennett, 2010: 208)
3. Three methods

In contrast to these treatments of PT as a single method, we believe that there exist three distinguishable variants of PT analysis. There are a number of commonalities across the three variants. All three variants share the ambition to study causal mechanisms. Ontological assumptions about the nature of causal relationships are also shared. These include the use of deterministic theorization (see below for more), and a ‘mechanismic’ understanding of causation, focusing on the process whereby causal forces are transmitted through a series of interlocking parts of a mechanism to produce an outcome (for more, see Beach and Pedersen, forthcoming). Additionally, all three methods draw upon a Bayesian logic of inference to make within-case inferences about the presence/absence of causal mechanisms (Bennett, 2008b; Beach and Pedersen, forthcoming). Finally, the three variants of PT share a theoretical understanding of mechanisms as invariant; either they are present or not. This implies that set-theoretical understandings of concepts are utilized (for more, see Beach and Pedersen, forthcoming).

What differentiates the three variants is:

- whether they aim to build or test theorized causal mechanisms
- their understanding of the generality of causal mechanisms (from systematic mechanisms expected to be present in a population to case-specific mechanisms)
- the types of inferences being made, where theory-testing/building variants are only able to make inferences about the presence/absence of a mechanism in a single case, whereas explaining outcome PT enables inferences about the sufficiency of the explanation in the single case to be made.

These differences have important methodological implications for research design that are masked when we treat PT as a single method.

The three variants are: 1) theory-testing PT that deduces a theory from the existing literature and then tests whether there is evidence that a hypothesized causal mechanism is actually present in a given case; 2) theory-building PT that has the ambition is to build a theoretical explanation from the empirical evidence of a particular case, resulting in a systematic mechanism being theorized; and 3) explaining outcome PT, which is a case-centric
method that attempts to craft a minimally sufficient explanation of an outcome using an eclectic combination of theoretical mechanisms and/or non-systematic, case-specific mechanisms.

We now turn to an in-depth discussion of what defines the three methods, focusing upon what the types of inferences being made, the understanding of mechanisms being used (i.e. what is actually being traced in practice), along with the implications these differences have for whether they can be nested in mixed-methods research designs.

3.1. Theory-testing PT

Theory-testing PT is a deductive research method, testing whether a hypothesized causal mechanism exists in a single case. At the core of theory-testing PT is a structured empirical test of whether there is evidence suggesting that a hypothesized causal mechanism exists in reality. This variant of PT is often used when a robust empirical correlation between an X and a Y has been found in previous research, but we are unsure whether there is an actual causal mechanism linking X and Y. Causal mechanisms are here treated as middle-range theories, and are expected to be present in a population of cases when the scope conditions that trigger them are present.

In theory-testing PT we know both X and Y and we have either a) existing conjectures about a plausible mechanism or b) are able to deduce one from existing theorization relatively easily. Conceptualization in theory-testing PT is a deductive exercise, where using logical reasoning we formulate a causal mechanism whereby X produces Y. In practice, theory-testing has inductive elements, especially regarding the operationalization of empirical tests, where we draw on existing empirical work to make case-specific empirical predictions of what evidence we should see if the theory is valid.

The amount of logical work necessary to flesh out a causal mechanism depends upon whether existing theories are formulated in terms of mere correlations (X:Y), as plausible causal links between X and Y (e.g. intervening variables), or as full-fledged causal mechanisms. Most common is the situation where we know X and Y but where the process (i.e. causal mechanism) whereby X causes Y has not been explicitly conceptualized. If a detailed causal mechanism has not already been formulated, the first step of theory-testing PT
is to conceptualize a plausible causal mechanism, focusing on the parts of the mechanism that are theorized to be necessary for the mechanism to produce Y.

The next step is to develop a set of predicted observable manifestation for each part of the causal mechanism. However, at the core of theory-testing PT is a structured empirical test of whether there a hypothesized causal mechanism is actually present in the evidence of a given case. Empirical material is then gathered to see whether the predicted observable manifestations were present or not. If strong evidence is found for these observable manifestations, we can infer that the hypothesized causal mechanism is present in the case based upon Bayesian logic of inference (Bennett, 2008b; Beach and Pedersen, forthcoming).

Note that theory comes first, followed by a detailed empirical analysis of single cases where evidence is gathered in a focused manner, aiming at testing whether the evidence predicted by the theorized mechanism is actually present in the case.

It is important to also note that in conceptualizing mechanisms, they can be helpfully thought of in terms of a series of parts composed of entities engaging in activities (Machamer, Darden and Craver, 2000; Machamer, 2002). Entities are what engages in activities (the parts of the mechanism, i.e. toothed wheels), where the activities are the producers of change or what transmits causal forces through a mechanism (the movement of the wheels) (Ibid). Entities can be individual persons, groups, states, or structural factors depending upon the level of the theory. It is important to note that the theoretical conceptualization of the entities includes nouns and the activities include verbs that are the ‘transmitters’ of causality through the mechanism. In social science terms, social entities have causal powers that can be understood as a ‘...a capacity to produce a certain kind of outcome in the presence of appropriate antecedent conditions.’ (Little, 1996: 37).

Each of the parts of a causal mechanism can be theorized as being an individually insufficient but necessary part of the mechanism in theory testing PT. Parts have no independent existence in relation to producing Y; instead they are integral parts of a ‘machine’ that produces Y. The engine of a car by itself has little utility in producing forward movement. Understood in this manner, the necessity of parts of a mechanism has an important disciplining effect in our theoretical development as redundant parts should be eliminated from the model. 2

2 Here we argue that a causal mechanism should be conceptualized as a system that transmits causal forces from X to produce Y. This differs from scholars who conceptualize a mechanism as a series of intervening variables.
By explicitly conceptualizing the activities that produce change, the mechanismic approach to causal mechanisms draws our attention to the actions and activities that transmit causal forces from X to Y, i.e. how the mechanism produces an outcome. If we then can confirm the existence of a hypothesized causal mechanism in a theory test we have produced strong evidence that shows how the theorized parts of the causal mechanism produce Y, and that X and Y are causally connected by the mechanism (Bunge 1997, 2004).

Conceptualizing in these terms enables us to capture theoretically the actual theorized process whereby causal forces are transmitted through a causal mechanism to produce an outcome; forces that are black-boxed in both frequentist and set-theoretical causal theorization. For instance, Casillas, Enns and Wohlfarth put forward a causal theory on the impact that public opinion (X) has upon the decisions made by the US Supreme Court (Y) (Casillas, Enns and Wohlfarth, 2009). They then collect data that enables them to test whether changes of public opinion in a more liberal direction are followed by changes in judicial decisions in a more liberal direction – however the causal mechanism linking X and Y is black-boxed in the analysis. In contrast, causal mechanisms describe both the initial condition of a causal process and the outcome, but, equally important, the theoretical mechanism in between X and Y that produces the outcome. A PT analysis of the theorized relationship between public opinion and Supreme Court decisions would analyze a causal mechanism that theorizes about the process whereby public opinion becomes salient for judges and how and when they are theorized to respond to perceived shifts in public opinion.

What then are we actually tracing when we engage in theory-testing PT? Figure 1 illustrates a simple abstract example of a theory-testing case study. The first step in testing whether a hypothesized causal mechanism was actually present in the case is to conceptualize a causal mechanism between X and Y based upon existing theorization. In this example a two part mechanism between X and Y is deduced, each part of which is composed of entities

Adopting a variable understanding of the elements in the causal mechanism implies that a) the values they can take vary, and b) they have an existence independent of each other, as each variable is in effect a self-contained analytical unit. Variance implies that a probabilistic understanding of causality is utilized. Second, the use of intervening variables usually has the practical consequence that the linkages between the variables are neglected. The neglect of the causal linkages between variables results from the simple fact that when a causal mechanism is conceptualized as being composed of a series of intervening variables it is far easier to measure the presence/absence of an intervening variable than the linkages between them. The analytical focus on variables instead of linkages is strengthened by the regularity understanding of causality that is used by King, Keohane and Verba (1994), among others. The result is that the intervening variable understanding ends up ‘grey boxing’ the causal mechanism itself. While the mechanism is slightly unpacked, the actual transmission of causal forces from X that produce Y are not explicitly studied (Bunge, 1997).
engaging in activities. This theorized causal mechanism then needs to be operationalized in step 2, translating theoretical expectations into case-specific predictions of what observable manifestations each of the parts of the mechanism should have if the mechanism is actually present in the case.

Once the mechanism is conceptualized and operationalized, the analyst proceeds to step 3, where she collects empirical evidence that can be used to make causal inferences, updating our confidence in 1) whether the hypothesized mechanism was actually present in the case, and 2) whether the mechanism functioned as predicted, or whether there were only some parts of the mechanism that were present. The bold lines in figure 1 illustrate the inferences made in theory-testing PT, where we infer from the empirical evidence collected that a causal mechanism was present in the case.

![Figure 1 - Theory-testing PT](image-url)
Note that the empirical analysis in step 3 proceeds step-wise, testing whether evidence indicates that each part of the mechanism was present or not. Most importantly, the evidence that is necessary to test whether the different parts are present can be very different, making evidence for the parts non-comparable with each other. In this respect, a theory-test does not read like an analytical narrative (see Büthe, 2002; Rubach, 2010), in that while evidence in the form of events can be an observable manifestation of one part of a causal mechanism, other types of evidence such as pattern evidence (e.g. the number of documents produced by different agencies) can be relevant to test other parts of the mechanism. Evidence is presented that critically assesses whether the observable implications of each step were present or not. Good examples of the non-narrative construction of empirical analyses in theory-testing PT can be seen in Owen (see below) and Moravcsik (1999).

In the example given in figure 1, the evidence that could update our confidence in whether agitation by liberal elites was present could include pronouncements by key liberal actors in the case, whereas evidence for government responding to this agitation could include sequence evidence (e.g. whether the temporal chronology matches a predicted pattern if the part existed) and account evidence (e.g. interviews with participants asked whether they took an action due to public pressures or other reasons).

However, the core focus of theory-testing PT is the theorized causal mechanism illustrated in figure 1, meaning that what we are in effect tracing in theory-tracing PT is the theorized causal mechanism.

An example – Owen’s theory-testing PT

Owen’s work broke with the existing research that merely investigated the correlation between X (democracy) and Y (peace) (Owen, 1994, also 1997). Drawing on existing theorization, Owen deduces a five part hypothetical causal mechanism that could explain how democracy could produce peace (Owen, 1994).\(^3\) Owen identifies the entities and activities that make up each part of the hypothesized causal mechanism that transmits causal forces from

\(^3\) Owen uses the term causal mechanism to refer to what can be seen as intervening variables (see figure 1, p. 102). However, the set of hypotheses for the existence of the mechanism that he develops (pp. 102-104) actually describes the workings of the causal mechanism in a series of parts, and therefore in our opinion can be seen as a proper conceptualization of a causal mechanism.
mutual democracy (X) to produce peace (outcome). This is illustrated in the left-hand column of table 1, below. Entities are underlined and activities are in italics.

**Table 1 – The five parts of Owen’s causal mechanism whereby democracy produces peace**

<table>
<thead>
<tr>
<th>Theoretical level</th>
<th>Case-specific expectations of observable implications for Franco-American crisis of 1796-98</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Context</strong></td>
<td>Crisis between states that can result in war</td>
</tr>
<tr>
<td><strong>Independent variable (X)</strong></td>
<td>Pair of states where analyzed state is democratic, and where opponent is either democratic (liberal) or autocratic (illiberal) state</td>
</tr>
<tr>
<td><strong>Part 1 (n₁ →)</strong></td>
<td>Liberals will <em>trust</em> states they consider liberal and <em>mistrust</em> those they consider illiberal</td>
</tr>
<tr>
<td><strong>Part 2 (n₂ →)</strong></td>
<td>When liberals <em>observe</em> a foreign state becoming liberal democratic by their own standards, they will <em>expect</em> pacific relations with it</td>
</tr>
<tr>
<td><strong>Part 3 (n₃ →)</strong></td>
<td>Liberals will <em>claim</em> that fellow liberal democracies share their ends, and that illiberal states do not</td>
</tr>
<tr>
<td><strong>Part 4 (n₄ →)</strong></td>
<td>Liberals will <em>not change</em> their assessment of foreign states during crises unless those states change their institutions</td>
</tr>
<tr>
<td><strong>Part 5 (n₅ →)</strong></td>
<td>Liberal elites will <em>agitate</em> for their policies during war-threatening crises</td>
</tr>
<tr>
<td><strong>Outcome (Y)</strong></td>
<td>The President and Congressional Federalists were</td>
</tr>
</tbody>
</table>

Liberals in US perceived France to be democratic

US republicans trusted France and mistrusted Great Britain

Republicans cheered the French Revolution, and expected pacific relations with their sister republic

Republicans claimed that French shared their ends, whereas Great Britain did not

Republicans did not change their favorable assessment of France, despite Federalist efforts

Republicans agitated against war with France
During crises, statesmen will be constrained to follow liberal elites, thereby not going to war with other liberal states.

|--------------------|

Owen could have chosen to be more conventional, choosing either to conceptualize the causal mechanism as a series of intervening variables, or by tracing an empirical series of events that preceded the outcome. If Owen had formulated his analysis as a correlation-based analysis, he would have defined the different components in his analysis as intervening variables, resulting in a design that was only able to demonstrate the existence of the intervening variables and whether they co-varied with the outcome within a population of cases. The intervening variable design would however be unable to capture how the parts of the causal mechanism transmit causal forces from X to produce Y. He could also have employed a study that built a descriptive narrative of ‘what happened’ leading up to the outcome (peace), listed as a sequential series of case-specific events. However, this type of analysis is arguably not PT, as no explicit effort is made to trace causal mechanisms in the case.

In his article he then operationalizes the causal mechanism into case-specific expectations of observable implications of the existence of each part of the mechanism (see below) (step 2 of figure 1). In the article, he then undertakes four case studies, but given that the evidence gathered in each case study is not comparable across cases, these are in effect four parallel single case PT studies. In each case study, the empirical analysis is structured in a step-wise fashion, investigating whether the expected case-specific observable implications are present or not.

Table 1 illustrates the case-specific expectations for one case (the Franco-American crisis of 1796-1798). Note that the evidence necessary to test whether the parts were present or not is very different depending upon the part of the mechanism being tested. This ranges from evidence of part five (liberal elites (Republicans) agitating against war), which would include speeches by key liberal actors and their views expressed in prominent liberal newspapers and other sources, whereas evidence for part one would include pronouncements etc that could measure liberal perceptions of France.
Can theory-testing PT be nested in mixed-methods research designs?

Theory-testing PT therefore involves the explicit tracing of causal mechanisms in a single case. What is being traced is not a series of empirical events, but instead we are tracing the underlying theorized causal mechanism itself by observing whether the expected case-specific implications of its existence are present or not in a case. Causal mechanisms can vary in the degree of generality, ranging from mechanisms that are theorized to operate in a narrow context, over middle-range theories, to more law-like propositions like the democratic peace mechanism. However, the mechanisms that we test in theory-testing PT are what can be termed systematic mechanisms, meaning that they are expected to operate within a population of cases larger than one.\(^4\)

Using a Bayesian logic of inference (see Bennett, 2008b; Beach and Pedersen, forthcoming) we can make within-case inferences using PT, updating the degree of confidence we have in the presence/absence of causal mechanisms in the particular case. However, we cannot infer automatically that because we found the causal mechanism in case A that it also is present in a broader population of cases. Therefore, theory-testing PT cannot be used to make cross-case inferences beyond the single case. However, cross-case inferences are possible when we nest a theory-testing PT into a larger mixed-methods research design.

When can we employ theory-testing PT in a mixed-methods design? First, theory-testing can be employed when an empirical correlation between an X and Y has been found using either small-n, comparative-historical methods, medium-n qualitative comparative analysis or large-n regression-based analysis. After establishing this correlation the next step is to deduce a hypothetical causal mechanism that plausibly can link the two variables or factors in order to test whether there is an actual causal relationship between X and Y, and if found, contribute to our understanding of how X produces Y. Cases are then selected where both X and Y are present.

Second, theory-testing can also be used in situations where there are well-developed theoretical conjectures, but we are unsure whether they have empirical support. Moravcsik has used theory-testing PT in this type of situation, where there was a well-developed theory,

\(^4\) - It is important to stress that in qualitative case-study research, the ambition of generalization has clear bounds. Qualitative scholars stress the context-dependent nature of theoretical propositions based upon extensive case-specific knowledge, and therefore usually make much more limited, context-specific generalizations (Munck, 2004). For more on different forms of contexts of political phenomenon, see Goodin and Tilly (2006).
but where there was considerable uncertainty regarding whether there was an actual empirical correlation between X and Y (Moravcsik, 1999).

However, nesting theory-testing PT requires two conditions to be fulfilled. First, theories need to be formulated in a deterministic fashion in theory-testing PT. The argument here is that testing a probabilistic theory in a single case study basically makes no sense (Mahoney, 2008). If we are testing a probabilistic mechanism and do not find the expected evidence in the case, we do not know whether the theory is faulty or whether the particular case was the exception that proves the general rule. We contend that it only makes sense to test deterministic theories using theory-testing PT. In contrast, regression-based analysis test probabilistic theories of association between X and Y.

This however poses a daunting challenge when attempting to combine theory-testing PT with large-n regression-based analyses in the manner suggested by Lieberman (2005). Yet conversation between probabilistic and deterministic theories is possible when we can reconceptualize a probabilistic theory from a regression-based analysis into a deterministic one to be used in a PT test (see Goertz and Starr, 2003; Mahoney, 2008). More promising potentially is a nested design where the large-n analysis is performed using QCA methods, where theories are formulated in a deterministic manner.

The second challenge relates to whether testing whether a causal mechanism is present or not in a single case is testing the same thing as a theoretical proposition that X causes Y. The problem relates to what exactly what type of causal relationship we are making inferences about. In regression-based large-n analysis and in comparative methods inferences are made about patterns of regularity between X and Y, and we collect evidence that can confirm or disconfirm this. In contrast, in theory-testing PT we are making inferences about the presence of a causal mechanism between X and Y, collecting evidence about whether the observable manifestations of each part of the mechanism are present in a single case. In other words, causal inferences based upon empirical evidence are being made about two different things; whether X causes Y, and whether a causal mechanism between X and Y is present. In plain English, inferences are made about two different things: causal effects versus causal mechanisms.

One potential solution to this conundrum that should be explored further is to investigate ways that PT results can be exported by re-conceptualizing 'X+mechanism' as a composite variable. For example, Owen’s democratic peace causal mechanism could be re-
conceptualized as a composite variable composed of ‘democracy + liberal groups + responsive government’ that could then be analyzed using other methods such as medium-n, fuzzy-set qualitative comparative analysis (fsQCA) (Ragin, 2000). Note also that fsQCA uses a deterministic understanding of causality, making it easily compatible with PT tests.

Concluding, theory-testing PT attempts to trace whether a hypothesized causal mechanism was present in a single case. Within-case inferences are made using Bayesian logic to update our confidence in the presence/absence of the mechanism in the case. Theory-testing PT can however be nested in a broader mixed-methods design only when the two conditions are fulfilled: 1) theories are formulated in a deterministic fashion (or at least can communicate with each other), 2) causal inferences are being made about roughly the same thing (X+mechanism->Y or X:Y?).

3.2. Theory-building PT

The second identifiable variant of PT also has theoretical ambitions beyond the confines of the single case. In its purest form, theory-building PT starts with empirical material and uses a structured analysis of this material to induce a plausible hypothetical causal mechanism whereby X is linked with Y. The logic behind theory-building PT is best expressed in the following quote from Sherlock Holmes, ‘It is a capital mistake to theorize before one has data. Insensibly one begins to twist facts to suit theories, instead of theories to suit facts.’ (Doyle, 1892: 14). While it is mentioned as a possibility in the literature, this inductive, theory-building variant of PT is surprisingly neglected, with to our knowledge no attempts having been made to show how it actually is done in practice.

What is being ‘traced’ is a theoretical causal mechanism that is expected to be present across a population of cases (i.e. it is a systematic mechanism). The core difference between theory-testing and building is one between deductive and inductive methods. In theory-building PT, empirical material is used to build a hypothesized theory, infer from empirical evidence that what is found reflects the observable implications of underlying causal mechanism. A second inferential leap is made by inferring from these observable implications that they actually reflected an underlying causal mechanism. However, common is that the focus is to trace a hypothetical causal mechanism by detecting its empirical manifestations.
While theory-building PT as an inductive method has some elements that overlap with explaining outcome PT (see below), the key difference is that theory-building has nomothetic ambitions, i.e. the ambition is to build a (relatively) parsimonious theory of a systematic causal mechanism that is generalizable outside of the context of the individual case, whereas the focus of explaining outcome PT is on building a minimally sufficient explanation of the outcome in the individual case. Theory-building PT studies do not claim that the detected causal mechanism is sufficient to explain the outcome; instead the more pragmatic goal is merely to detect a mechanism that has a causal relationship with Y. The aim of theory-building PT is to build a middle-range theory of a causal mechanism that is expected to function within a bounded context (e.g. spatially or temporally bounded). In the words of Evans, to ‘...be useful, these configurations had to be conceptualize in ways that were potentially separable from the settings in which they were originally derived.’ (Evans, 1995:6).

Theory-building PT is utilized in two different research situations: 1) when we know that a correlation exists between X and Y, but we are in the dark regarding potential mechanisms linking the two (X-Y centric); and 2) when we know an outcome (Y), but where we are unsure what are the causes (X) (Y-centric).

The basic framework of a theory-building PT case study is illustrated in figure 2. After the key theoretical concepts (X and/or Y) are conceptualized, theory-building proceeds to investigate the empirical material in the case (step 1), using evidence as clues about the possible empirical manifestations of an underlying causal mechanism between X and Y that fulfills the guidelines given above for a properly conceptualized causal mechanism. This involves an intensive and wide-ranging search of the empirical record; in the words of Sherlock Holmes, ‘Data! Data! Data!’ he cried impatiently. ‘I can't make bricks without clay.’ (Doyle, 1892: 343).
Step two involves inferring from the observable empirical evidence that observable manifestations that reflect an underlying plausible causal mechanism were present or not in the case. Evidence does not speak for itself. Often theory-building does have a deductive element, in that scholars seek inspiration from existing theoretical work and previous observations for what to look for. For example, an analyst investigating socialization of international administrative officials within international organizations could seek inspiration in theories of domestic public administration, or in psychological theories of small group dynamics, while also reading more descriptive accounts of the workings of international organizations as sources of inspiration for plausible causal mechanisms. Here existing theory can be thought of as a form of ‘grid’ to detect systematic patterns in empirical material,
enabling inferences about observable manifestations to be made. In other situations the
search for mechanisms is based upon hunches drawn from puzzles that are unaccountable for
in existing work. Step three is then the secondary inferential leap from observable
manifestations to infer that they reflect an underlying causal mechanism.

Figure 2 depicts that a underlying theoretical causal mechanism is also what is being
traced in theory-building PT, illustrated by the shaded lines that form the backdrop of the
theoretical level ($X$, causal mechanism, $Y$). In contrast to theory-testing, the empirical analysis
itself, understood as the collection of the ‘facts’ of the case, is two inferential leaps removed
from the theorized causal mechanism. This is illustrated by the bold lines linking the ‘facts’
with observable manifestations (primary inferences) and the subsequent inferential leap from
these observable implications to the inference that parts of an underlying causal mechanism
existed.

In reality, theory-building PT is usually an iterative and creative process. Hunches of
what to look for that are inspired by existing theoretical and empirical work are investigated
systematically, with the results of this search then forming the background for further
searches. This means that steps 1 and 2 are often repeated before step 3 is reached.

An example – Janis’ theory-building PT

An example of a theory-building PT work is Janis’ book on Groupthink (Janis, 1982). In the
book he attempts to build a causal mechanism that details how conformity-pressures in small
groups can have an adverse impact upon foreign policy decisions, using a selection of case
studies of policy fiascoes that were the result of poor decision-making practices by small
group of policy-makers who constituted a cohesive group. He uses the term Groupthink to
describe the causal mechanism whereby conformity-pressures in small groups produce poor
decisions.

The first exploratory case that he uses in the book is an analysis of the Bay of Pigs fiasco.
He notes first that Groupthink was by no means the sole cause of fiasco (Janis, 1982: 32), but
at the same time he notes a puzzle that existing explanations are unable to explain; why did
the ‘best and the brightest’ policy-making group in the Kennedy administration not pick to
pieces the faulty assumptions underlying the decision to support the intervention. He writes
that, ‘Because of a sense of incompleteness about the explanation, I looked for other causal
factors in the sphere of group dynamics.’ (Janis, 1982: 32-33). He suggests that the Groupthink mechanism is a part of the explanation, but is not sufficient to explain the outcome (Janis, 1982: 34).

The starting point of each of his case studies is to draw upon psychological theories of group dynamics, and relevant political science theories, such as Allison's organizational model, and own previous research as an inspiration for his search through empirical record for systematic factors that form part of possible Groupthink causal mechanism. His search for parts of the mechanism is also informed by empirical works on the Bay of Pigs decision. For example, he writes that, ‘...when I reread Schlesinger’s account, I was struck by some observations that earlier had escaped my notice. These observations began to fit a specific pattern of concurrence-seeking behavior that had impressed me time and again in my research on other kinds of face-to-face groups...Additional accounts of the Bay of Pigs yielded more such observations, leading me to conclude that group processes had been subtly at work.’ (Janis, 1982: vii). Here we see the importance that imagination and intuition also plays in devising a theory from empirical evidence, while at the same time he is informed by theoretical research.

Step 1 then involves collecting empirical material in order to detect potential observable manifestations of underlying causal mechanisms. Inferences are then made from empirical evidence to infer that observable manifestations existed (step 2), resulting in the secondary inference that an underlying mechanism was present in step 3. He writes that, ‘For purposes of hypothesis construction – which is the stage of inquiry with which this book is concerned – we must be willing to make some inferential leaps from whatever historical clues we can pick up. But I have tried to start off on solid ground by selecting the best available historical writings and to use them as my springboard those specific observations that appear to be solid facts in the light of what is now known about the deliberations of the policy-making groups.’ (Janis, 1982: ix). Further, ‘What I try to do is to show how the evidence at hand can be viewed as forming a consistent psychological pattern, in the light of what is known about group dynamics.’ (Janis, 1982: viii)

The presentation of the empirical evidence is not in the form of an analytical narrative describing events or causal steps between X and Y. Instead, he writes that, ‘Since my purpose is to describe and explain the psychological processes at work, rather than to establish historical continuities, I do not present the case studies in chronological order. The sequence I
use was chosen to convey step-by-step the implications of group dynamics hypotheses.' (Janis, 1982: viii-ix). He describes four different ‘symptoms’ of Groupthink that can be understood as observable manifestations of a Groupthink mechanism, including the illusion of invulnerability held in the group, the illusion of unanimity within the group, the suppression of personal doubts, and the presence of self-appointed mind-guards in the group. For example, the shared illusions of invulnerability and unanimity helped members of the group maintain a sense of group solidarity, resulting in a lack of critical appraisal and debate that produced a dangerous level of complacent overconfidence.

He concludes that, ‘The failure of Kennedy’s inner circle to detect any of the false assumptions behind the Bay of Pigs invasion plan can be at least partially accounted for by the group’s tendency to seek concurrence at the expense of seeking information, critical appraisal, and debate. The concurrence-seeking tendency was manifested by shared illusions and other symptoms, which helped the members to maintain a sense of group solidarity. Most crucial were the symptoms that contributed to complacent overconfidence in the face of vague uncertainties and explicit warnings that should have alerted the members to the risks of the clandestine military operation – an operation so ill conceived that among literate people all over the world the name of the invasion site has become the very symbol of perfect failure.’ (Janis, 1982: 47)

*Can theory-building PT be nested in mixed-methods research designs?*

Theory-building PT involves the explicit tracing of causal mechanisms in a single case, building what is expected to be a more general causal mechanism based upon the empirical evidence in the case. As such, theory-building can in principle be nested in a mixed-methods research design, contingent upon same two conditions that applied for theory-testing (deterministic theories and theories of mechanisms).

Theory-building PT can either be used either 1) when we know that an X:Y correlation exists, but where we are in the dark regarding potential mechanisms that link the two, or 2) when we know the outcome but where we are unsure about what caused it, i.e. we have a deviant case. In both situations, the theorized mechanism that has been built using PT can be tested/re-tested using other methods such as fsQCA, contingent upon the two conditions being fulfilled.
3.3. Explaining outcome PT

The goal of many (if not most) PT studies is actually to explain a particular historical outcome, not test or build a theory of a systematic mechanism. This is termed a single-outcome study, defined as seeking the causes of a specific outcome in a single case (Gerring, 2006). Here the ambition is to craft a *minimally sufficient explanation* of a particular outcome, with sufficiency defined as an explanation that accounts for all of the important aspects of an outcome with no redundant factors being present (Mackie, 1965). While explaining outcome PT studies sometimes resemble historical scholarship, this type of PT is in our opinion still explicitly theory-guided empirical research, and good explaining outcome studies have theoretical ambitions that reach beyond the single cases.

It is vital to first note that the term causal mechanism is used in a much broader sense in explaining outcome PT than in theory-testing or building variants. First, whereas theory-testing and building variants of PT aim to test/build relatively simple, parsimonious mechanisms, to craft a minimally sufficient explanation we almost always need to combine mechanisms into an eclectic conglomerate mechanism to account for a historical outcome. Evans for example writes that, ‘Cases are always too complicated to vindicate a single theory, so scholars who work in this tradition are likely to draw on a mélange of theoretical traditions in hopes of gaining greater purchase on the cases they care about.’ (Evans, 1995: 4). Schimmelfenning notes that, ‘...eclecticism is the unintended result of research that seeks to explain specific events as well as possible.’ (in Sil and Katzenstein, 2010: 191). The result is case-specific combinations of mechanisms in eclectic conglomerates (see below for an example).

Second, given that the ambition is to craft a minimally sufficient explanation of a particular outcome instead of developing a generalizable mechanism, it is usually necessary to include *non-systematic mechanisms*; i.e. mechanisms that can be understood as case-specific mechanisms in our explanation. While Elster contends that mechanisms have to be at level of generality that transcends particular spatio-temporal context (i.e. they are systematic mechanisms) (Elster, 1998: 45), thereby excluding the use of non-systematic mechanisms in explaining outcomes, other scholars have more pragmatically argued that mechanisms that are *unique* to a particular time and place also can be defined as mechanisms. Wight for instance has defined mechanisms as the, ‘...sequence of events and processes (the causal
complex) that lead to the event.’ (Wight, 2004: 290). Non-systematic mechanisms can play an important role in explaining a particular outcome. In this respect, explaining outcome PT can sometimes be more analogous to the historical interpretation of events (Roberts, 1996), and mechanisms that include non-systematic factors will include significant events that are case-specific. In order to craft a minimally sufficient explanation we often also have to work backwards from a known outcome by tracing the empirical process that led to it.

However, the inclusion of non-systematic mechanisms that are often depicted as events has an important advantage, in that it enables us to capture actor choice and the contingency of historical events that pervades historical events, immunizing our research from the criticisms of political science from historical scholars (Gaddis, 1992/93; Rueschemeyer, 2003; Roberts, 1996; Schroeder, 1994). In the words of Lebow, ‘...underlying causes, no matter how numerous or deep-seated, do not make an event inevitable. Their consequences may depend on fortuitous coincidences in timing and on the presence of catalysts that are independent of any of the underlying causes.’ (Lebow, 2000-2001: 591-592).

The admission of case-specific causes does not mean that they are preferable (Gerring, 2006). ‘To clarify, single-outcome research designs are open to idiographic explanation in a way that case study research is not. But single-outcome researchers should not assume, ex ante, that the truth about their case is contained in factors that are specific to that case.’ (Ibid, p. 717).

What differentiates explaining outcome PT from historical research is both a causal-explanatory focus, where the analysis is theory-guided, and the ambition to go beyond the single case (Hall, 2003; Gerring, 2006). As regards the ambition to go beyond the single case, this involves attempts to identify what mechanisms are systematic and non-systematic in the specific case study. This is done in particular in book length works, where this type of questioning is often found in the conclusions where lessons for other cases are developed. What factors do we believe can potentially be systematic based upon the findings of our study and in light of what we know from other research? What findings can potentially be ‘exported’ to other cases, and to what extent are they unique to the case? For example, based upon the findings of two in-depth, explaining outcomes case studies, Jervis discusses the implications of the findings for the broader phenomenon causes of intelligence failure in foreign policy making (Jervis, 2010).

Summarizing, a minimally sufficient explanation will often be composed of both
composite mechanisms in an eclectic combination that is specific to the individual case, and non-systematic (i.e. case-specific) mechanisms. The inclusion of case-specific mechanisms and/or case-specific combinations prevents explaining outcome PT from being nested into mixed-methods designs – a point that will be elaborated upon further below.

Explaining outcome PT is an iterative research strategy that aims at tracing causal mechanisms defined in the broader and more pragmatic sense discussed above. Explaining outcome PT can start by using either a deductive or inductive path. This is illustrated in figure 3 depicted below.

The deductive path follows the steps described above under theory-testing, where an existing mechanism is tested to see whether it can account for the outcome. In most explaining outcome studies, existing theorization cannot however provide a sufficient explanation, resulting in a second stage of research where either a deductive or inductive path can be chosen informed by the results of the first empirical analysis. If the deductive path is chosen again, this would involve testing alternative theories to see whether they can provide a sufficient explanation. In the example given below, Schimmelfennig first tests rationalist mechanisms, followed by a sociological mechanism, finding both insufficient to account for the outcome. He then creates an eclectic combination of the two theories which he tests in a third iteration of the case study and finds it sufficient. Alternatively, the inductive path can be chosen in the second iteration, using empirical evidence to build a better explanation.
The inductive path is often used when we are studying a little-studied phenomenon. Here the analyst can proceed in a manner more analogous with historical methodology (Roberts, 1996), for example working backwards from the outcome by sifting through the evidence in an attempt to uncover a plausible sufficient causal mechanism that produced the outcome. On the inductive side, explaining outcome PT is in many ways analogous to classic detective work, or what can be termed a ‘CSI’ type of analysis. In the series CSI, a typical situation is where the forensic team has the body of the victim and a suspect, but where they are in the dark regarding how and why the suspect potentially committed the murder. Based upon a thorough forensic analysis the CSI team builds a theory for how and why the suspect committed the murder. This is a bottom-up type of analysis, using empirical material as the basis for building a plausible explanation of causal mechanisms whereby X (or multiple X's)
produced Y.

The important question is then when should we stop this process - i.e. how do we know a minimally sufficient explanation when we see it? There is no foolproof answer to this question; instead the decision that we have a minimally sufficient explanation is based upon a subjective assessment of whether all of the relevant facets of the outcome have been accounted for adequately, while at the same time ensuring that the evidence is best explained by the developed explanation instead of plausible alternative explanations. We can never confirm a theory with 100% certainty; instead we stop when we are satisfied that the found explanation is able to account for the outcome beyond any reasonable doubt - the standard that is good enough for suspects to be found guilty in a criminal court (Good, 1991).

An example – Schimmelfenning’s explaining outcome PT (the deductive path taken)

A good example of explaining outcome PT can be seen Schimmelfennig’s article on the Eastern enlargement of the EU (2001). The article attempts to explain a particular empirical puzzle, which is why countries like France that were opposed to Eastern Enlargement of the EU ended up not opposing it (p. 49).

The case study proceeds using three iterations of the deductive path (see figure 3). He takes as his point of departure two competing theorized causal mechanisms from ‘rationalist’ and ‘sociological’ theories of international cooperation to explain the existing EU member states’ positions towards Eastern Enlargement. He first tests a rationalist mechanism and finds it can account for national preferences but not for the final decision to enlarge. Informed by the findings of his first empirical analysis, he undertakes a second deductive analysis that tests whether a sociological mechanism can account for the outcome. He finds that it can account for the final decision of France to accept enlargement, but it cannot account for the negotiating process.

Not surprisingly therefore, Schimmelfennig finds that neither can fully explain the outcome (neither is sufficient), finding them both ‘wanting in the “pure” form’ (2001:76). In response he uses the empirical results of the first to iterations to formulate an eclectic combination of the two mechanisms that attempts to ‘...provide the missing link between egoistic preferences and a norm-conforming outcome’ by developing the idea of ‘rhetorical action’ (the strategic use of norm-based arguments).
In the third iteration of the case study he tests this eclectic conglomerate mechanism, finding that it provides a sufficient explanation of the historical outcome. He provides strong evidence suggesting that the more complex mechanism is actually present in the case and that it is sufficient to account for the outcome. Sufficiency is confirmed when it can be substantiated that there are no important aspects of the outcome that are unaccounted for by the explanation.

In all three iterations, Schimmelfennig is tracing causal mechanisms. However, in the first two iterations the rationalist and sociological mechanisms are more generally applicable, whereas the eclectic conglomerate is much more case-specific, limiting the ability to make generalizations based upon the findings of the study.

*Can theory-building PT be nested in mixed-methods research designs?*

The purpose of explaining outcomes PT is different from the two above-mentioned variants. In explaining outcome PT we try to establish a minimally sufficient explanation for why an outcome has been produced in a specific case, whereas theory-testing and building have nomothetic ambitions beyond the specific case.

Explaining outcome PT includes both systematic mechanisms, more case-specific (non-systematic) mechanisms and eclectic case-specific conglomerates in the explanation in order to craft a minimally sufficient explanation of a specific outcome. This type of PT leans more heavily towards being an idiographic case study, interested in the particular case, instead of a nomothetic, ambition to generalize to a broader population. The distinction is fittingly described by Przeworski and Teune as the difference between cases described using proper nouns preceded by definite articles (idiographic cases like *the* French Revolution) and those described by common nouns coupled with indefinite articles (nomothetic – *a* revolution) (Przeworski and Teune, 1970).

The inclusion of non-systematic mechanisms and case-specific eclectic conglomerates in explaining outcome PT studies makes it impossible to nest this type of PT case study in a mixed-method research design (Rohlfing, 2008: 1494-1495; Gerring, 2006). ‘However, in single-outcome studies the purpose of the study is to explain *that* particular case. Here, varying results from cross-case and within-case analysis cannot be treated lightly. And here, because the objective is to provide a reasonably complete explanation, it is not permissible to dismiss evidence as part of the error term (noise).’ (Gerring, 2006: 726-727).
Instead, a good explaining outcome PT study will point to potential systematic factors that can be investigated further by future studies, or that can act as building blocks for future attempts to build generalizable causal mechanisms that can explain outcomes across the population of relevant cases. For example, Jervis’ analysis of intelligence failures by the US national intelligence community attempts to build minimally sufficient explanations of failure in two cases; the failure to detect the coup against the Iranian Shah in 1979, and the belief that weapons of mass destruction were present in Iraq in 2003 when they were not (Jervis, 2010). Yet the conclusions discuss the lessons that are potentially applicable to other comparable cases; lessons that can be understood as a series of systematic factors that can be investigated in further research (Ibid).
4. Conclusion

The argument in this paper is that we need to differentiate PT (PT) methods into three distinct variants. Common to all three variants is the ambition to trace causal mechanisms, although the term causal mechanism as used in theory-testing and theory-building variants refers to relatively parsimonious mechanisms that are generalizable to a population of cases, whereas in explaining outcome PT mechanisms refer both to systematic mechanisms, case-specific, non-systematic mechanisms (events leading to an outcome), and eclectic case-specific conglomerates of different mechanisms.

Table 2 summarizes the main points of difference across the three variants of PT. Theory-testing and theory-building PT have nomothetic ambitions that focus on finding or testing systematic mechanisms in single case studies, whereas explaining outcome PT is a more idiographic, case-centric mode of research that aims to craft a minimally sufficient explanation of an outcome.

Table 2 – Summary of the main differences between the three variants of PT.

<table>
<thead>
<tr>
<th>Purpose of analysis</th>
<th>Theory-testing</th>
<th>Theory-building</th>
<th>Explaining outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test whether causal mechanism linking X:Y is present in case</td>
<td>1) Identify plausible causal mechanism linking X:Y 2) formulate mechanism that produced Y in deviant case</td>
<td>Build minimally sufficient explanation of particular historical outcome</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Ambitions of study</th>
<th>Theory-centric</th>
<th>Theory-centric</th>
<th>Case-centric</th>
</tr>
</thead>
<tbody>
<tr>
<td>Systematic (generalizable)</td>
<td>Systematic (generalizable)</td>
<td>Systematic, case-specific mechanisms and conglomerates of mechanisms</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Understanding of causal mechanisms</th>
<th>Theory-testing</th>
<th>Theory-building</th>
<th>Explaining outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parts of causal mechanism present/absent in case</td>
<td>Parts of causal mechanism are necessary to produce an outcome</td>
<td>Jump from empirical material to infer that underlying causal mechanism existed</td>
<td>- Minimal sufficiency of explanation</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Types of inferences made</th>
<th>Theory-testing</th>
<th>Theory-building</th>
<th>Explaining outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Parts of causal mechanism present/absent in case</td>
<td>- Parts of causal mechanism are necessary to produce an outcome</td>
<td>- Causal mechanism is</td>
<td></td>
</tr>
<tr>
<td>Uses of variant of PT in a broader mixed-method design</td>
<td>present/absent in case</td>
<td></td>
<td></td>
</tr>
<tr>
<td>------------------------------------------------------</td>
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</tr>
<tr>
<td>1) an X:Y correlation has been found but we are unsure of causality 2) a well-developed theory exists but we are unsure whether there is empirical support</td>
<td>1) an X:Y correlation has been found but we are unsure of the mechanism whereby X produces Y 2) we are unable to explain what caused Y with existing theories, resulting in the building of a new theorized mechanism that can account for the deviant case</td>
<td>Not possible due to the inclusion of non-systematic factors, although limited 'lessons' can be drawn about potential systematic factors that merit further research in other cases</td>
<td></td>
</tr>
<tr>
<td>*use in mixed-method design contingent upon: a) theories formulated in deterministic manner b) ability to translate X+mechanism into composite variable/condition</td>
<td>*use in mixed-method design contingent upon: a) theories formulated in deterministic manner b) ability to translate X+mechanism into composite variable/condition</td>
<td></td>
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</tbody>
</table>

The inclusion of case-specific, non-systematic mechanisms (events leading to an outcome), and eclectic case-specific conglomerates of different mechanisms in explaining outcome PT limits our ability to nest this variant of PT into mixed-methods designs. In contrast, given two conditions (see table 2), both theory-building and testing PT designs can be nested into mixed-method designs.
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