

Chapter Eleven:

Integrating Comparative and Within-Case Analysis: Typological Theory

Typological theorizing has a long history in the social sciences, with significant developments dating back to Max Weber's discussion of "ideal types" early in the 20th century and Paul Lazarsfeld's analysis of "property spaces" in the 1930s.ⁱ Typological theorizing is thus well known for its advantages in theorizing about complex phenomena without oversimplifying, clarifying similarities and differences among cases to facilitate comparison, providing a comprehensive inventory of all possible kinds of cases, incorporating interactions effects, and drawing attention to "empty cells" or kinds of cases that have not occurred and perhaps cannot do so.ⁱⁱ We build upon these advantages and add to earlier discussions of typological theorizing in several ways. First, we discuss throughout the chapter how typological theorizing and the cross-case comparisons it facilitates can be integrated with within-case methods of analysis to allow structured iterations between theories and cases. This combination of cross-case and within-case analysis greatly reduces the risks of inferential errors that arise from using either method alone. Second, we clarify the connections between typological theorizing and recent discussions of causal complexity in the social and natural sciences, thereby refining traditional arguments about the ability of typological theories to accommodate complexity. The discussion of this issue, which is itself complex, is relegated to an appendix to preserve the flow of the present chapter. Third, we show how typological theories can help identify which cases might best be selected for each of the

alternative research designs and theory-building purposes discussed by Harry Eckstein and others. In this regard, typological theories allow researchers to match up extant theories, the kinds of cases ideally suited for further developing them, and the actual historical cases available for study. Finally, we discuss means of developing manageable typological theories of a half-dozen or more variables, despite the combinatorial complexity of such theories, and we urge researchers to go well beyond the two or three variables included in most typological theories thus far.

The chapter first elaborates upon the brief definition of “typological theory” in Chapter 1. We distinguish such theory from historical explanation and also emphasize that it is different from theories ranging from universal single-variable covering laws at one end of the spectrum to highly contextualized causal mechanisms at the other. We also distinguish between taxonomic types or typologies, which have a variety of uses in research, and the use of such types to build theories. We then analyze various levels and kinds of complexity in social theorizing, including equifinality, path dependency, and interactions effects, and discuss the ways in which typological theorizing can incorporate them. This leads to a discussion of inductive and deductive strategies for the development of typological theories. The chapter concludes with an extended example of typological theorizing on burden sharing in contemporary security coalitions.

(1) What Is Typological Theory?

When effectively accomplished, typological theory makes a distinctive contribution. In contrast to a general explanatory theory of a given phenomenon, typological theory provides a rich and

differentiated depiction of a phenomenon and can generate discriminating and contingent explanations and policy recommendations.

We define a typological theory as a theory that specifies independent variables, delineates them into nominal, ordinal, or interval categories, and provides not only hypotheses on how these variables operate singly, but contingent generalizations on how and under what conditions they behave in specified conjunctions or configurations to produce effects on specified dependent variables.ⁱⁱⁱ We call specified conjunctions or configurations of the variables “types.” A fully specified typological theory provides hypotheses on all of the mathematically possible types relating to a phenomenon, or on the full “property space,” to use Lazarsfeld’s term. Typological theories are rarely fully specified, however, because researchers are usually interested only in the types that are relatively common or that have the greatest implications for theory-building or policy-making.

Typological theories specify the pathways through which particular types relate to specified outcomes. Such pathways are analogous to “syndromes.” In pathology, a disease or physical state may arise through different causal paths, and it may exhibit varying symptoms and degrees of severity, so pathologists speak of syndromes -- clusters of causes and outcomes -- rather than just talking of a single manifestation of a particular disease. Typological theory is similarly open to the possibility of equifinality -- the same outcome can arise through different pathways.^{iv} For example, one typological theory on deterrence, instead of simply addressing “deterrence failure,” specifies different kinds of deterrence failure: failure through *fait accompli*, limited probes, or controlled pressure.^v

Typological theories differ from historical explanations of a particular event. A historical explanation refers to a series of specific connections in an extant historical case, often supported by relevant available theories. In contrast, typological theory identifies both actual and potential conjunctions of variables, or sequences of events and linkages between causes and effects that may recur. In other words, it specifies generalized pathways, whether the path has occurred only once, or a thousand times, or is merely hypothesized as a potential path that has not yet occurred. A pathway is characterized in terms of variables, often with nominal cut-off points distinguishing among types but at times with ordinal or interval cut-off points, rather than by the values of these variables associated with a historical case. Instead of focusing on the “Russian revolution” per se, a typological theory would explain this revolution as one example of the type of revolutions that, for example, follow an international war; replace weak state institutions; and take place amidst an economic crisis. Even if there is only one revolution fitting this type, by identifying the conjunctive effects of its underlying causal mechanisms, we can generalize in a limited way to possible future revolutions that fit the same type.^{vi} Such generalized pathways are what is distinctive about typological theory. They are abstract and theoretical even though they are “closer” to concrete historical explanations than are claims about causal mechanisms.^{vii} Specific pathways, in turn, can be supported by extant hypotheses on causal mechanisms. Cognitive dissonance theory and prospect theory, for example, provide causal mechanisms that under certain conditions support explanations of recurring patterns of behavior.

Typological theories are often constructed and refined through case study methods; they can also benefit from quantitative methods and formal models. The hallmark of a fruitful and cumulative

typological theory is the refinement of contingent generalizations that differentiate both independent and dependent variables in ways that produce increasingly close similarity of cases within each type, as well as sharper distinctions between types. Examples of such theories, in addition to that on deterrence discussed above, are evident in the literatures on coercive diplomacy, the security dilemma, political revolutions, alliance burden-sharing, and many other issues.^{viii}

Such differentiated theories not only allow for more discriminating explanations; they are also of greater practical value for policymakers, who can use them to make more discriminating diagnoses of emerging situations. Contrast, for example, a general explanatory theory such as “war is often the result of miscalculation” with a typological theory that distinguishes the conditions under which different types of miscalculations (misapprehensions about the changing balance of power, misinterpretations of an adversary’s motives, failure to understand the bureaucratic or domestic constraints on the adversary, and so on) may lead to war. As another example, policy-makers who are aware of different types of surprise may be better able to avoid being surprised by an adversary.

(2) From Typologies to Typological Theories

The relationships among types, typologies, typological theories, and their usefulness in case study methods for theory development, are important but underdeveloped topics. Some researchers have noted that typologies can control for specified variables and help establish similar cases for purposes of comparison.^{ix} Others have downplayed the role of typologies, without distinguishing them clearly from typological theories. We argue that typologies and especially typological theories can serve

broader and more ambitious purposes in case study research and the social sciences than is generally acknowledged.

The formulation of typologies is a familiar activity in social science research. A typology is defined as a device for partitioning events into types that share specified combinations of factors.^x Ideally, these types are mutually exclusive and exhaustive, that is, every case of the phenomenon fits into a type, and only into one type, and types are designed to minimize within-type variation and maximize variation between types.^{xi} Investigators are often interested in making a complex phenomenon, such as revolutions or military interventions, more manageable by dividing it into variants or types. They do so by identifying clusters of characteristics that differentiate instances of the phenomenon. Depending on the investigator's research objectives, identification of a single type may suffice, or development of a differentiated typology of many types may be necessary.

Typologies may thus take many different forms and have different uses, some more ambitious than others. Among the less ambitious uses, a typology may do little more than identify the qualitative types of a single multi-dimensional variable, either an independent or dependent variable. For example, a differentiated dependent variable could be types of deterrence failure, and a differentiated independent variable could be types of coercive diplomacy employed to change the behavior of an adversary.

Typologies can also characterize variants of a given phenomenon in terms of conjunctions of variables, such as types of social unrest that may or may not lead to revolutions. In their most complex form, typologies can include conjunctions of multi-dimensional independent variables together with types of a multi-dimensional dependent variable. For example, a typology might include types of military

interventions that vary by regional context, domestic politics in the target state, scale, scope, goals, and instruments employed.^{xii}

It is important to note that in a typology, in contrast to a typological theory, the constituent characteristics or combinations of “factors” are not necessarily theoretical variables. This is likely to be the case when the typology has not been developed within a theoretical framework. Nor does a typology itself link independent and dependent variables in a causal relationship. Thus, while the less ambitious uses of typologies may serve to facilitate the development of theory, they do not in themselves constitute theory. As Paul Diesing has noted, types and typologies are at best only implicit theories or starting points for theory construction; hence “typologies must eventually be controlled by [explicit] theory of some sort to be reliable.”^{xiii} Even if it exhibits a perfect correlation among a set of factors, a typology alone is not a theory and cannot separate causal from spurious factors, or possible from unlikely or impossible combinations of variables.

However, the finding of a typological regularity can spur the search for underlying theoretical explanations or typological theories, which can then be tested through within-case analysis. For example, as noted in Chapter 2, the democratic peace research program has evolved through several stages in which the findings of correlations among types of states and wars have preceded the development of satisfying theoretical explanations for these correlations. The types of states and wars have become more refined at each stage of this process, including a shift from a general democratic peace to an interdemocratic peace, from democracies in general to transitional, parliamentary, and presidential democracies, and from “wars” to various levels and kinds of militarized interstate disputes.

Our focus is on this more ambitious use of case studies to move from typologies to the development of typological theories, and on the use of typological theories for the design of case study research and the selection of cases to study.

(2) Inductive and Deductive Means of Developing Typological Theories

Typological theories may be constructed through either inductive or deductive modes of inquiry. In many research projects and research programs, a combination of induction and deduction is useful or even necessary, with the relative roles of each varying according to the research objective, the state of development of the research program in question, and the availability of relevant cases to study. Case studies can contribute to the inductive development of typological theories in the early stages of a research program by identifying an initial list of possible theoretical variables. In the later stages of a research program's development, when theories have already been established and tested to some extent, the inductive study of "deviant" cases that do not fit the existing theory may refine the typological theory and perhaps add new variables or a new causal path to it.^{xiv} Theoretical arguments derived through these inductive processes must of course be subjected to further testing to prevent "overfitting" and forestall the introduction of spurious variables.^{xv} Turning to the construction of deductive typological theories, these may not only suggest an initial list of variables, but also point out the cases whose study is most likely to provide theoretical insights. Often, either a single researcher or a succession of researchers working on the same research program will move back and forth between induction and deduction depending on the needs of the research program as it develops.

(3) The Inductive Development of Typological Theories

In the early stages of reflection and research on a complex problem, the investigator may be reluctant to begin comparative study by attempting to build a research design and select cases based on a full, logically complete typology, or a typology that includes all of the logically possible types of a phenomenon. The investigator's research objective may be more modest in that she does not attempt at the outset to articulate a comprehensive typological theory but hopes to develop such a theory through a series of individual case studies. Research at this stage may be of an exploratory nature, relying on feedback from the initial case studies undertaken to assess, refine, or alter the theoretical framework in which explanation of individual cases will be couched and to identify components of a useful typology.

The aim is to develop a typological theory eventually, but the strategy is to proceed incrementally toward that goal. In opting for this more flexible strategy, the investigator seeks to gradually build a typology and a typological theory via empirical analysis of cases within a theoretical framework. Concern over the risk of a premature commitment to a well-defined, comprehensive typology, one that may prove inadequate after much research on a set of cases selected for that typology, plays a role in encouraging a more gradual approach. It should be emphasized, at the same time, that while this strategy relies on induction it is analytical, theory-driven induction. The use of analytical induction does not exclude making use of deductive or quasi-deductive theoretical ideas, particularly theories on discrete causal mechanisms that may form the building blocks for more ambitious or integrative theories, to help guide the empirical approach.

An examples may clarify why an empirical approach to development of typologies and associated typological theories is useful. To return to the example of the literature on deterrence, an a priori, “logical” approach to typologizing outcomes of efforts to achieve deterrence is likely to settle for a simple distinction between “success” and “failure” (in fact, this characterization of deterrence outcomes has been and continues to be used, particularly for the purposes of large N statistical studies). An empirical approach relying on explanations for different cases of failure^{xvi} enables the investigator to discover different types of failures and to pinpoint specific (different) explanations for each type of failure. The different causal patterns of deterrence failure become part of a typological theory of deterrence. Such a differentiated theory of failures is significantly different from, and often more useful than, a theory that attempts to provide a single explanation for all deterrence failures.

Note that the development of typological theory via the case method strategy takes advantage of the possibility that equifinality may characterize many aspects of social and political life. Empirically-derived, theory-oriented case studies are particularly suited for discovering and pin-pointing equifinality and for developing typological theory for the phenomenon in question. Each case may turn out to be useful insofar as it permits the investigator to identify a different causal pattern. Differentiated explanations of the outcomes of the cases which are all instances of the class of events that is being investigated becomes a part of a cumulative typological theory, or a “repertoire of causal mechanisms” of that phenomenon.^{xvii}

As this discussion suggests, the typology -- and the ensuing typological theory -- may be derived empirically, not necessarily by starting with 2x2 (or larger) boxes of two (or more) variables.

To this end the investigator should avoid a premature, a priori characterization of variance of the dependent and independent variables. Rather, the variance should emerge via differences discovered in the explanation of the cases. And the investigator should avoid overly general ways of characterizing such variance that limit the variance to but a few alternatives. For example, using the George-Smoke deterrence study again, treatment of variance in outcomes of deterrence attempts should not be limited to “success” and “failure”; rather, the case studies and their cumulation into a theory should be sensitive to the presence of equifinality. Hence, the possibility that each case of “failure” may have a somewhat different explanation can lead to a typology of failures; similarly with cases of deterrence “success” (if it were possible to make valid determination of “successful” deterrence).

The causal relationship between arms races and war provides another example of the need for more discriminating conditional generalizations. One comprehensive assessment of the voluminous literature on this problem concludes that “there is still no well-developed theory that describes the conditions under which arms races will or will not lead to war. Nor is there a theory that provides a reliable guide for policy makers.”^{xviii} What available scholarship does tell us is that arms races are neither a necessary condition for the occurrence of war nor a sufficient condition for war. Given additional assessment of relevant historical experience, it should be possible to develop a typological theory of different “arms race --->war” causal relationships. Comparative analysis of different cases of a phenomenon may also enable the investigator to identify a number of conditions which, if present in an arms race, increase the likelihood of war. Such a finding would identify ways in which policy makers might act to reduce or control the likelihood that an ongoing arms race might result in war.

There is a danger that such a procedure will lead to an infinite number of types as it can always be argued that each case is idiosyncratic enough to warrant creation of a new type to encompass it. The investigator can and should exercise judgement as to the extent to which to construct from the cases more and more refined, narrowly circumscribed types (and sub-types of a type). In the George-Smoke deterrence study, three major types of deterrence failure emerged from the cases studied; the possibility of introducing sub-types of the three types was recognized but not pursued since the objectives of the investigation did not require it.

The typological theory that emerges obviously depends on what cases are selected for examination. Therefore, at the outset of the research, development of a typology and the associated theory must be open-ended. For example, new cases of deterrence encounters that are studied may lead to identification of new types of “success” or “failure.” Of course, new cases may turn out to be similar in type to one or another of those already studied.

Given the open-ended nature of theory development, it is appropriate to regard this research method as achieving a cumulation of findings via a “building-block” approach. That is, each case potentially provides a new component in the construction of a comprehensive typological theory. The number of types that will eventually be identified remains indeterminate (although as stated above, not infinite in number) until more cases are examined.

An important difference between this approach to theory development and reliance on large N statistical methods has to do with “cell reduction.” Investigators making use of statistical methods often engage in cell reduction -- i.e., enlarging the scope of types in order to get more cases in each type so

that statistical analysis becomes possible. This corresponds to what Giovanni Sartori has called moving up the “ladder of abstraction,” or generality.^{xix} One tradeoff involved in this shift to a higher level of generality is that it eliminates the possibility of a more differentiated analysis and reduces the richness of empirical studies. A less noted but equally important way of making the same point is that moving up the ladder of generality reduces the probability of observed correlations that apply to the defined concept. For example, we can make only low probability observations on the relationship of “parties” and “electoral laws” in “democracies,” but we can observe higher probability correlations among specific types of parties (ruling, opposition, swing voting, etc) in states with specific types of electoral laws (winner take all, proportional, mixed, etc) in specific types of democracies (presidential, parliamentary, etc.). Conversely, moving down the ladder of generality increases richness and raises observed correlations, but it comes at the cost of parsimony and generalizability.

To be sure, cell reduction may be undertaken not only to permit statistical analysis but also for theoretical reasons. Investigators may resort to it in order to identify and explain more general characteristics that a large number of cases may have in common. It is certainly possible that even when cell reduction is undertaken largely to satisfy the requirements of statistical analysis it may still generate new concepts for the wider and broader types it creates. Cell reduction is unwarranted, however, when it is not guided by theoretical hypotheses and instead takes place in an ad hoc opportunistic search for some findings of a general character, to which new conceptual labels can be attached. This approach to theory development risks production of “findings” or “non-findings” that are artifacts of the push for cell reduction in order to make statistical analysis possible. The investigator employing an open-ended

approach to developing typological theory is not prevented from engaging in cell reduction at a later stage in the inquiry to formulate more general findings, so there is no need to resort to cell reduction prematurely.

The inductive development of typological theories has important limitations. It is not capable of inferring from case findings how frequently each type of causal pattern appears in the universe of cases of that phenomenon. This limitation follows from the fact that construction of typological theory works without requiring a representative sample of cases. In fact investigators engaged in developing typological theory explicitly disavow any effort to project frequency distributions from the cases they study. Sometimes, investigators deliberately select the least frequent or least “representative” cases -- deviant cases -- to see if they embody previously unexamined causal paths. It is thus not a legitimate criticism of typological theory that it cannot do that which it does not attempt to do. The value of typological theory does not rest upon an ability to project the expected frequency distribution of types in the total universe of cases of a given phenomenon. However, development of a typological theory does not preclude the possibility of projecting the frequency of the different causal patterns it has identified in the total universe later on. If a representative sample of that universe can be drawn, which is not always possible, a large N study can be undertaken to determine how frequently each type is likely to occur.^{xx}

In sum, in studies that seek to develop a typological theory the research objective is to identify the variety of different causal patterns that can occur for the phenomenon being investigated. In such studies, it would be useful for the investigator to pursue the additional research objective of identifying some of the conditions, or conjunctions of independent variables, under which each distinctive type of

causal pattern occurs. These research objectives, and not the question of how often each type of outcome and causal pattern occurs, guide the development of typological theory.

(3) The Construction and Use of Deductive Typological Theories

We turn to a discussion of a quite different approach for developing typological theories. The deductive approach, in contrast to the inductive method discussed above, requires that the investigator first construct a theory-based map of the property space by defining variables and hence the types these variables constitute through all their mathematically possible configurations.^{xxi} Such a framework can then be reduced to the most useful types for purposes of research design, case selection, and theory development.

Of course, such a deductive exercise proceeds by first designating the research objective of the investigation. The purpose may be to focus inquiry on the causal powers of particular factors or on explanation of a particular type of outcome (or class of outcomes). When the research objective is to assess the causal properties or powers of a particular factor(s) the investigator attempts to specify relevant theories, causal mechanisms, and variables that help provide such an assessment.^{xxii} A similar procedure applies when the research objective is to explain a particular type of outcome (or class of outcomes). In assembling relevant theories and variables it is important to focus on the predicted effects of interactions among combinations of variables.

An important advantage of typological theorizing in this regard is that it can move beyond earlier debates between structural and agent-centered theories by including within a single

typological framework hypothesizes on mechanisms leading from agents to structures and those leading from structures to agents.^{xxiii} This allows the theorist to address questions of how different kinds of agents (individuals, organizations, or states, depending on the level of analysis) behave in and change various kinds of structures. For example, Randall Schweller's work on alliance and alignment behavior in World War II essentially provides a typological theory on how different kinds of agents (status quo versus revisionist states) behave depending on their structural positions, or their military power and geographic circumstances relative to other states.^{xxiv} Many opportunities exist for fruitful typological theorizing that combines agents and structures into unified theories: theories of personality types or information processing styles and their interactions with different types of organizational designs, theories of types of states and their interactions with different types of international systems (in addition to that proposed by Schweller), theories of types of economic systems and their interactions with types of economic sectors or other economic actors, and so on.^{xxv}

As with the inductive development of typological theory, a key set of issues concerns how many independent variables to use to parse out the property space, whether to partition these variables into two or more types, and how finely to differentiate the dependent variable. As new variables are added, the number of types multiplies. For example, a typology with n dichotomous variables has 2 raised to the power of n possible types. Thus, a theory with four independent variables and one dependent variable, all dichotomous, would have 2 raised to the power of five or 32 types. Clearly, it quickly becomes difficult for the researcher to remember, use, and articulate more than a few of the most important types of a typology of five or more variables. As discussed below, the researcher might

respond by reducing substantially the number types to be investigated.^{xxvi} Alternatively, the researcher can focus on a few variables that are hypothesized to have the greatest causal weight, and construct a less complex property space (but one that risks violating the assumption of unit homogeneity within types because of the variables excluded from the analysis).^{xxvii}

As noted in the discussion above on cell reduction, the tradeoffs involved in adding variables to a typology are different from those involved in adding an independent variable to a statistical research design. Statistical methods require positive “degrees of freedom” for a meaningful result. In such methods, each additional independent variable requires a corresponding increase in the number of cases to be included in order to establish an estimate of the likelihood of a non-random relationship. This creates considerable pressure to keep the number of independent variables low unless data is extremely abundant, particularly if interaction effects (which also require a larger sample size to estimate) are to be taken into account.

This reasoning is appropriate to statistical methods, but it can be misleading on the issue of whether additional variables or types should be included in a typological theory that is to be explored through case studies. For the case study researcher, the exclusion of potentially relevant variables is in many respects a greater threat to valid inferences than the inclusion of additional variables that may or may not be spurious. Exclusion of a relevant variable interferes with both within-case analyses and cross-case comparisons. Inclusion of an additional variable, on the other hand, is rather unlikely to lead to spurious inferences as long as sufficient process tracing evidence is available to test whether the variable plays a causal role. Adding variables increases the complexity of the research design, and each

new variable requires additional observations if it is to be tested, but new variables do not raise an inherent problem of indeterminacy as long as they generate additional independent observable implications on causal processes and outcomes. This is true whether these independent observable implications are in the same case or in a separate case. The number of independent observations, not the number of cases, sets the upper limit on the number of independent variables that can be tested. Thus, the investigator should start with a broad range of variables identified in the theoretical literature as being potentially relevant to the phenomenon under study. He or she can also include candidate variables from the quasi-theoretical interpretations of political actors or regional or functional experts.

The more general tradeoff for the case study researcher is whether the problem at hand requires added theoretical complexity, whether process tracing evidence is available and accessible to deal with this complexity, and whether the problem is important enough to merit a complex theory -- we will create more sub-types of war than of snow (unless our lives depend on snow, as in the case of the Eskimo, who differentiate among many types of snow). Parsimony and simplicity are always preferable, but they should not be sacrificed when complexity is necessary for adequate explanatory theory.^{xxviii}

As in the inductive development of typological theories, it is important for researchers to give as much thought to differentiation of the dependent variable in deductive theories as they do to that of the independent variables. Far too many research designs provide detailed attention to the independent variables while lumping the dependent variable into a few vaguely-defined categories. As emphasized in Chapter 4 on research design, careful characterization of the dependent variable and its variance often proves to be one of the most important and lasting contributions to research.

Once the specification of variables is complete, it defines the property space. This constitutes the relevant universe of all possible combinations of variables, or types.^{xxix} It has been our experience in advising Ph.D. students that this is the point at which they often veer toward a nervous breakdown. Having specified their independent and dependent variables, and explored the theoretical literature on the causal mechanisms associated with each variable when it acts alone, thesis students are often dismayed to find that when, for example, five independent variables are assembled together with one dependent variable, there are sixty-four possible types. Moreover, with only a preliminary knowledge of the values that the variables assume in different cases, the researcher can only tentatively classify cases by type. In fact, while case selection and research design problems may appear to have become much harder, a preliminary deductive effort at typological theorizing on how the variables might interact, together with preliminary research on a number of cases, can greatly reduce and simplify the property space and contribute to systematic procedures for case selection and specification of the research design. Often, the process of visually putting together combinations of variables and placing cases into types spurs useful preliminary theorizing on how combinations of variables interact.^{xxx} In particular, we discuss three criteria for reducing the property space, and three research designs that may flow from the preliminary placement of cases into types.^{xxxi}

The first criterion for reducing the property space is that a preliminary typological theory may indicate that some types are not socially possible.^{xxxii} A good theory may be able -- in time, if not immediately -- to specify hypothetical cases or combinations of variables that should not exist or should at least be highly unlikely or infrequent.^{xxxiii} In other words, a particular outcome may be impossible

when the independent variables over-determine a different outcome. For example, we do not expect deterrence to fail when the deterrer has overwhelming and usable instruments of force, is far more committed to success than the opponent, communicates its intentions clearly, and faces a rational, unified, and attentive opponent. If we do find a failure in such circumstances, it may be treated as a “deviant case” which, when explained, may suggest new variables that need to be added to our typological theory.^{xxxiv}

Delineating types within the property space and developing a preliminary typological theory enables researchers to check whether they have been premature in deciding whether some types should not, according to the theory, exist in the social world. In other words, rather than merely assuming that the types which the theory predicts to be empty are in fact empty, the researcher should carefully consider whether there might be historical cases that fit these types, or whether it is possible that such cases could occur in the future.^{xxxv} One constraint on typological theorizing, like that on Mill’s methods as discussed in Chapter 8, is that the social world has not necessarily produced cases of all the types of a phenomenon that are socially possible, and we cannot tell for certain whether a type of case cannot occur or merely has not yet occurred. The disciplined use of counterfactual inquiries is in some sense an attempt to use counterfactual cases to fill in empty types for the purposes of comparison to actual cases. Fortunately, not all research designs require a fully inhabited property space. Single cases, if they are most-likely, least-likely, or especially crucial cases, can be quite revealing about the strength of a theory. Comparisons of a few cases, if they are most similar or least similar, can also be revealing. Some cases provide more information than others on the theoretical issues of interest to a particular researcher.

Moreover, for some research objectives, there may be cases for study representing most or even all of the possible types. The extant cases may also provide diverse causal paths even if the cases for any one causal path are not numerous enough for statistical methods.

Still, although single case research designs and no variance designs involving only the study of cases that are positive on the outcome of interest have their uses, researchers sometimes make the basic mistake of overgeneralizing from cases where the hypothesized cause and the hypothesized effect are both present. While there are valid research designs that use only one case study, or that focus on all the possible paths to a given effect or all the possible effects to a given cause, ideally in these designs the researcher should examine or at least invite others to propose and study cases where the hypothesized cause and/or effect are absent. More generally, working with a given property space, the investigator's causal inferences will be strongest if she or he attempts to study or at least considers cases of various types.

Consider, for example, a simple version of the democratic peace hypothesis, in which states are either democracies or non-democracies, and in which dyads have either engaged in war or maintained a peace. With these three dichotomous variables (democracy or non democracy for the first state, the same for the second, and either war or peace for the outcome) there are six possible types (there are not eight types because the order of cases in the mixed dyads does not matter). Most of the research on the democratic peace has focused on one type of case: dyads that are by some measures democratic but nonetheless go to war against one another (or the close cousins of these cases, near democracies that go to war, and near wars between democracies). The focus on these cases at the early stages of

the research program is appropriate, but depending on the nature of the hypothesized causal mechanisms, it may also be important to make comparisons to other kinds of cases. For example, do conflict resolution mechanisms between democracies differ from those between other kinds of dyads, including democracy/non-democracy dyads and non-democracy/non-democracy dyads?^{xxxvi}

This example suggests a second criterion for reducing the property space and choosing cases to study. When an outcome is overdetermined by existing theories and it turns out as expected it is less likely to be theoretically informative (although even here process tracing might point out that causal mechanisms did not operate exactly as expected). Such “most likely” cases are usually useful only when a theory unexpectedly fails to explain them, although most likely cases with variables at extreme values can also be useful for allowing the researcher to use process tracing to see in stark relief how the underlying causal mechanisms operate.^{xxxvii}

A third criterion for reducing the property space is the identification of which types and cases are suited to the research objective. This is true whether this objective is the testing of existing theories, comparison of typologically similar cases, identification and study of deviant cases, or use of a plausibility probe (or a preliminary and relatively easy test of a new theory). The research objective and the case study research design should be devised with a view toward the stage of development of the research program in question. New and relatively untested research programs are more likely to be advanced by plausibility probes and inductive studies of deviant cases, for example, while more advanced research programs may offer few or no clear deviant cases but may be amenable to theory-

testing case studies and studies of typologically similar cases with slightly different outcomes that might yield new sub-types or more finely differentiated variables.

This leads to the consideration of three different research designs that may flow from the specification of the property space, the preliminary specification of a typological theory, and the tentative categorization of cases into types. This is an opportunistic process that reconciles the kind of cases a researcher would ideally like to study, the alternative research designs available, and the actual historical cases available for study. In the first research design, if two cases fit into the same type according to their independent variables, our working assumption is that they should have similar outcomes. This offers the most basic test of the validity of the specification of the type. If the preliminary classification of cases into their respective types indicates that the outcomes of cases in the same type differ, then the researcher can perform full studies of these cases to assess whether and why one of them deviates from the expected outcome. This can uncover errors in the preliminary measurement and classification of one or both cases, or it may point to additional variables that deserve attention.^{xxxviii} Even if a change in the measurement of one of the cases or the addition of a new variable resolves the anomaly in the type in question, it may at the same time create another anomaly in another type, which then requires investigation.

A second potential research design arises when the preliminary classification of the cases indicates that two cases differ in only one independent variable and also in the dependent variable. This allows a “most-similar cases” research design. If exogenous variables can be ruled out as a source of variation in the outcome (admittedly not a simple matter), then there is some basis for inferring that

differences in the outcome can be attributed to the one variable in the typology on which the cases differ. This basis for inference can be strengthened by using process tracing to establish that the variation in the outcome was indeed due to the single independent variable that differed between the cases. Process tracing can also test whether factors left out of the typological framework and that differed between the two cases were causally related to the variation in the outcome.

In a third research design, the preliminary analysis of the property space can point to cases that may be particularly informative for theory development. Such analysis can facilitate the construction of “tough tests” by identifying which types might constitute most-likely, least-likely, and “crucial” cases. In a most likely case, a single variable is at such an extreme value that its underlying causal mechanism, even when considered alone, should strongly determine a particular outcome. If at the same time the other independent variables, considered singly and together, point toward the same outcome as the extreme variable, then this is a “crucial case.” If the predicted outcome does not occur, then the hypothesized causal mechanism underlying the extreme variable is strongly impugned. The failure of this mechanism cannot be blamed on the operation of the other variables in the framework. Conversely, if a case is weakly determined or least-likely for a single causal mechanism, alternative hypotheses offer different predictions, but the causal mechanism still correctly predicts the outcome, then this constitutes a crucial case that offers the strongest possible support for the mechanism.^{xxxix}

(2) Integrating Typological Theorizing and Process Tracing

Once the research design is set and the cases are selected, the researcher can begin doing the case studies using methods of within-case analysis. This can lead to more accurate measurements of the independent variables, which may require some cases to be reclassified into a different type from that to which it was assigned on the basis of the researcher's preliminary understanding of the case. The case studies may also lead to refinement of the cut-off points between types, and to the addition of new variables. Such changes to the preliminary typological theory may resolve anomalies but they may also create new ones, and they can also lead to changes in the research design and in the cases selected for study.

This iteration between theory and data and between within-case analysis and cross-case comparisons is a key advantage for typological theorizing as compared to comparative methods used alone. The aspects of typological theorizing that rely on cross-case comparisons are in some respects vulnerable to inferential problems like those that beset Mill's methods. Although typological theorizing does not require single variables to be necessary or sufficient for outcomes, as Mill's methods do, such theorizing, like all methods, remains vulnerable to erroneous inferences if relevant variables are omitted. Moreover, the most-similar and least-similar case comparisons facilitated by typological theorizing are based on the same logic as Mill's methods of difference and agreement, respectively. The key difference between typological theorizing and Mill's methods is that by relying on within-case methods as well as comparative methods, typological theorizing reduces (but does not eliminate) the risks of mistaken inferences.

Process tracing provides a check on whether explanatory claims developed from typological comparisons are spurious. While typological theorizing can help identify which cases are suitable for a most-similar case comparison, for example, process tracing is necessary to help determine whether the one independent variable that differs between two most similar cases is indeed causally related to the differences between these cases' outcomes. Process tracing can also help identify variables and interactions among them that have been previously overlooked.^{x1} The inductive side of typological theorizing and process tracing provides opportunities for researchers to identify variables they have not already thought to include. This does not guarantee that all relevant variables will in fact be identified, but typological theorizing provides a technique for identifying deviant cases that are likely to provide clues on omitted variables, and process tracing provides a means for exploring where those clues lead. Process tracing on "typical" cases can also point to overlooked variables. Indeed, one of the most visible and important contributions of case study methods has been to identify causal variables that have been left out of earlier analyses. This is evident in the literature on deterrence, for example, where case studies have added variables on psychological dynamics and domestic politics to spare deductive theories that included only interests, capabilities, and simple cost-benefit calculations.^{xli}

Similarly, the combination of typological theory and process tracing can both incorporate and help identify interactions effects. If a researcher has deductively outlined the interactions he or she expects in a type of case, process tracing can test for their presence. If the researcher has only identified the configuration of variables that defines the type but has not specified the interactions among

them, process tracing can help identify inductively the interactions that took place in cases of the specified type.^{xlii}

(2) An Extended Example: Burden Sharing in Contemporary Security Coalitions

The above criteria for first delineating and then reducing the property space, specifying the research design, and selecting cases make it possible to reduce significantly the number of typological categories and cases to be studied. The use of a preliminary typological theory for case selection is in fact one of its most important functions. An example, involving two related studies of alliance burden-sharing in the 1990-1991 Persian Gulf conflict by Bennett, Leggold, and Unger, illustrates the preceding discussion. The first study used existing theories to identify five variables that should affect alliance contributions: 1) ability to contribute (collective action theory), 2) the specific threats Iraq presented to the potential contributor (balance of threat theory), 3) the potential contributor's security dependence on the U.S. (alliance security dilemma theory), 4) the issue-specific strength of the state vis-a-vis that of the society (strong state/weak state theory) and, 5) the power and interests of top government officials (bureaucratic politics theory).^{xliii} This study used a preliminary assessment of interactions among these variables to help guide case selection, and then it used the resulting cases to inductively refine and codify a better-specified typological theory. The later study added a sixth variable, "lessons that leaders drew from previous alliance experiences" (learning theory), and it tested the typological theory from the first study against additional cases.^{xliv} The dependent variable in both studies was differentiated into three

kinds of alliance contributions: military, political, and economic. The resulting property space in the first study was complex, with 32 possible types of different combinations of independent variables, and three dichotomous outcome variables (or eight possible outcomes), yielding 256 possible types if all variables are treated as dichotomous (the second study involved an even more complex space of 512 possible types due to the added independent variable). Table 1 presents a version of the typological theory from the first study, simplified for purposes of illustration by collapsing the two domestic politics variables into one variable, displaying only the predicted outcomes rather than all possible outcomes, and presenting outcomes as only contribution/no contribution rather than breaking them into kinds of contributions. The variables for each of the constituent theories in the table are coded Yes or No as follows: Collective Action: would a contribution from the country in question (including military bases) be important to achieving the public good of expelling Iraqi forces from Kuwait? Balance of Threat: did the country face a potential military threat from Iraq? Alliance Dilemma: was the country dependent on the U.S. for its security? Domestic Politics: did the public, legislature, and national security organizations generally favor a contribution? The table also shows the placement of cases from both the first and second studies into their respective types. The coding of the cases is greatly simplified from the measures in the actual case studies, particularly in the cases of France, Syria, and the U.S.S.R., each of which contributed politically and/or militarily to the Gulf Coalition in part to “share the spoils” as part of the winning side and to maintain or establish good relations with the United States, even though none was greatly reliant on the United States for its security. Syria and the U.S.S.R. thus constituted deviant

cases, to some degree, drawing attention to “share the spoils” or “offensive bandwagoning” motives as an important factor omitted from the typological theory.

Table 1
A Typological Theory on Burden Sharing in the 1991 Gulf War

Cases	Collective Action	Balance of Threat	Alliance Dilemma	Domestic Politics	Expected Outcome
Saudi Arabia	Y	Y	Y	Y	Contribute
Turkey	Y	Y	Y	N	Contribute*
	Y	Y	N	Y	Contribute
	Y	N	Y	Y	Contribute
	N	Y	Y	Y	Contribute
	Y	Y	N	N	Contribute*
United States	Y	N	N	Y	Contribute
	Y	N	Y	N	Contribute*
Britain	N	N	Y	Y	Contribute
Egypt	N	Y	Y	N	Contribute*
	N	Y	N	Y	Contribute

France, Canada Australia	N	N	N	Y	Contribute
Germany, Japan	N	N	Y	N	Contribute*
Iran, Syria	N	Y	N	N	No Contrib.
	Y	N	N	N	No Contrib.
China, USSR	N	N	N	N	No Contrib.

* In types marked with an asterisk, countries are expected to contribute only if strong state leaders override domestic opposition, as happened in Egypt and Turkey. In the cases of Japan and Germany, security dependence on the United States was so high that domestic opposition was muted.

The typological table shows how it was possible to reduce substantially the number of types of interest and select which cases to study. Cases that were overdetermined by a mix of variables or by a few variables at extreme values, such as the Kuwaiti and Saudi contributions to the Desert Storm coalition, were deemed unlikely to be theoretically informative (though if such states had failed to contribute, they would have constituted potentially useful deviant cases). The same was true of overdetermined non-contributors -- distant states not threatened by Iraq, not dependent on oil or the world economy, and not reliant on the U.S. for their security. The first study thus selected case studies of the leading contributors: the U.S., Britain, France, Germany, Japan, and Egypt. These varied substantially in the kind of contributions they made, and they included most-likely cases for each of the theories whose variables contributed to the typological theory (except that on the balance of threats, and

its overdetermined most-likely cases of Saudi Arabia and Kuwait). However, as the authors noted, this first study relaxed the ideal criteria for case selection, as it did not include studies of states that might have contributed but did not do so. The second study, which included additional case studies by regional experts, included a non-contributing “free-rider,” Iran. This second study also included an abbreviated examination, or “mini-case study,” of China, a state whose failure to make a substantial or costly contribution appeared to be (and upon closer study indeed was) overdetermined. This illustrates how abbreviated case studies can be used to fill in types that are unlikely to be surprising but may turn out to be so. Finally, the second study included a brief examination of contributions to the UN peacekeeping mission in Bosnia (UNPROFOR) and the NATO Implementation Force (IFOR) peacekeeping mission that succeeded it. This allowed a further test of the theoretical framework in a separate coalition. It also provided a before-after comparison of the effects of the alliance security dilemma variable, since the U.S. largely stayed out of the UNPROFOR mission but then joined the IFOR coalition and pushed others to do the same (of course, this comparison is imperfect, as the Dayton accords changed the context in Bosnia greatly).

The case selection in these burden-sharing studies allowed for a test of the key assertion that cases in the same type should have similar outcomes. Germany and Japan fit the same type, as they were both dependent on the U.S. for security, relatively distant from the Middle East, dependent on foreign oil, and domestically constrained on the use of force. The typological framework passed this test of its viability, as these similar cases had very similar outcomes -- both states provided over \$8

billion each but sent no combat troops. Other states, such as Syria and Iran, had similar values on many of their independent variables but very different outcomes, pointing to Syria as a deviant case that allowed a test of which independent variables (in this instance, differing domestic politics, relations with the U.S., and offensive bandwagoning motivations) accounted for the differences in outcomes. This illustrates how case study researchers, after constructing a property space, should be alert to “targets of opportunity,” identifying potential case studies that might fit various research designs, including most similar cases, least similar cases, deviant cases, most-likely cases, least-likely cases, crucial cases, and so on. It is also often possible to carry out more than one of these kinds of case study or case comparison within a single study -- cases that are most similar with respect to one another, for example, may be least similar to a third case, or a case may be most-likely for one hypothesis and least-likely for another.

Table 1 also draws attention to the empty types. Most of the empty types in this instance do not seem socially impossible, and readers may be able to think of examples from the Gulf War or other security crises. Indeed, some cases existed in types that would have seemed least plausible according to the theory. For example, it seems unlikely that a country whose contribution would be useful or even necessary for defeating Iraq, whose security was threatened by Iraq, and whose security depended on the United States would face significant domestic opposition to contributing to the coalition, yet this combination occurred in Turkey and might point to unusual domestic political circumstances omitted from the theory. Thus, even though the outcome in this case fit that predicted by the theory, the process

was rather surprising. Similarly, we might expect few instances in which a country had no international incentives to contribute but domestic audiences favored a contribution, yet there were many such countries (most of which made symbolic contributions). These cases point to altruistic and/or “share the spoils” motives left out of the theory.

Subsequent opportunities for alliance burden-sharing, while not yet the subject of full studies, appear upon initial examination to fit this typological theory fairly well and offer opportunities to further refine it. These more recent cases include NATO’s participation in air strikes against Serbia over the issue of the status of Kosovo, the U.S.-led coalition in the war against the Taliban government of Afghanistan, and the U.S.-led coalition in the second Gulf War.^{xlv} The war against the Taliban, in particular, provides a good example of a potential building-block addition of a new type to the theory. In the study of the first Gulf War, the authors set aside the case of Israel as being too idiosyncratic to include in the general theoretical framework. Israel in effect contributed to the Desert Storm coalition by not contributing -- it heeded U.S. requests not to take military action against Iraq, even while under attack from Iraqi Scud missiles, because action by Israel would have made it difficult politically for Arab states to continue to contribute to the coalition. Although this provided a clear historical explanation for the case of Israel, the phenomenon of “contribution by inaction” seemed insufficiently common to merit including in and thereby complicating the theory. The coalition against the Taliban, however, also included a country that contributed by inaction. India offered to contribute assistance to the coalition, but it was clear that Indian participation would reduce Pakistan’s willingness to assist the United States,

so the United States demurred at India's offer. The Israeli and Indian cases also appear to have been similar in that each country arguably used the United States's desire to keep them on the sidelines as a source of leverage over U.S. policies of interest to each country (respectively, Middle East peace talks and the status of Kashmir). An opportunity may thus exist to add a new type to the theory by including a variable for "relations among potential contributors" and studying these and other cases of contribution by inaction.

Finally, these burden-sharing studies demonstrate how a complex typological theory can be presented as a causal diagram, albeit one that remains complex. The causal diagram in Figure 1, from the first study, corresponds with the typological theory in Table 1 (the correspondence is inexact only because Table 1 collapses the two domestic variables into one for presentational simplicity). Figure 1 groups together similar outcomes while still allowing for alternative paths to these outcomes (i.e., equifinality). Moving from the left to the right of the figure, the six boxes on the left represent the independent variables, the three "outcome" boxes represent the dependent variable, and the boxes on the right represent path dependent interpretations of cases that might have arrived at the same outcome through different routes. Each possible path through the Y/N boxes in Figure 1 corresponds with one of the types in Table 1 (again, with the proviso that the table has one fewer variable and hence 16 fewer possible paths). For example, Iran and China both arrived at the first outcome, but they did so through very different processes. Iran greatly valued the goal of an Iraqi defeat but it lacked any dependence on the U.S. and it "rode free" on the efforts of the American-led coalition that fought Iraq. China did not

greatly value the goal of an Iraqi defeat, so it “kept its distance” by making only the minimal political contribution of not exercising its veto on the UN Security Council.

More generally, the four path-dependent interpretations in the figure turn on whether a state’s contribution, or lack thereof, matched the value it placed on the public good of reversing the Iraqi invasion. First, a state “rides free” if, like Iran, it values the good but does not contribute. Second, a state “keeps its distance” if, like China, it does not value the good and does not contribute. Third, a state “reveals its preferences and pays up” if it values the good and contributes. This could arise through various contributions of perceived threat, alliance dependence, and domestic politics, as in the cases of Britain and Egypt. Fourth, a state is “entrapped” if it does not value the good but contributes anyway due to alliance dependence, as in the cases of Japan and Germany.

[Figure 1 Here]

While this example illustrates the potential power of typological theories and their utility in selecting cases, the development of typological theory also suffers from important limitations.^{xlvi} Researchers are liable to miss some possible causal relationships, and to face indeterminacy in assessing others. The main reason for this is that extant historical cases may represent only a few of the combinations of variables that are possible in the social world. In addition, left-out variables and probabilistic causal mechanisms can further weaken causal inferences from case studies and the development of typological theories.

In practice the severity of these limitations may be reduced through rigorous case study methods. First, as noted above, not all cases are equally theoretically informing, and a single crucial or nearly crucial case can strongly support or undermine a theory. Second, good case study researchers, cognizant of the limits of their methods, should be careful to avoid over-generalizing their conclusions or claiming to have uncovered all possible causal paths. Finding cases that represent previously undocumented causal paths has always been a priority for case study researchers. Third, as our example of alliance burden sharing indicates, much of the property space in a given study can be set aside as unlikely or uninformative, allowing relatively strong inferences from even a small number of cases if they fall into the types of greatest interest. Fourth, the use of previously validated causal mechanisms or social theories to build typological frameworks, together with the use of process tracing and other methods of within-case analysis, can strengthen the inferences that would otherwise have to be made on the basis of comparative methods alone. Fifth, it is important to distinguish between

instances where the range of extant historical cases is insufficient for strong causal inferences, and instances in which the researcher does not have the resources to study all of the potentially informative cases. In the former instance, case study methods will be weak but may be the only methods available. In the latter, researchers may focus their efforts on a sub-set of the property space, where even a few cases may exhaust the causal paths of most interest, and/or they may add “mini-case studies” of otherwise unexamined types to test and strengthen their inferences.

(2) Conclusions

The use of case studies for the development of typological theories, and the use of these theories in turn to design case study research and select cases, are iterative processes that involve both inductive study and deductive theorizing. An inductive, building-block approach to developing typological theories can identify causal paths and variables relevant to a given outcome. Such an approach is particularly useful in new or emerging research programs and in the study of deviant cases. Ultimately, as additional cases are examined this building-block process can outline an increasingly comprehensive map of all of the causal paths to an outcome. A deductive approach to typological theorizing can help test established theories when they are available and propose integrative theories that incorporate interaction effects and address the problem of equifinality. Combining these modes of inductive and deductive development of typological theories with methods of within-case analysis,

particularly process tracing, can substantially reduce the limitations of Mill's methods and other methods of comparison.

A greater awareness of the strengths and uses of typological theories and case studies, however, also provides a sharper understanding of their limits. Typological theories, case studies, process tracing, and congruence tests reduce but do not eliminate the limits similar to those that afflict Mill's methods of agreement and difference. Left-out variables and measurement errors can undermine causal inferences no matter what methods are used. Case study researchers should be sensitive to interaction effects but there is no guarantee that they will incorporate and explain such effects adequately. Finally, when low probability causal relations hold and there are only a few cases, no methods of causal inference can work well.

Endnotes

i. Max Weber, *The Methodology of the Social Sciences*, translated by Edward A. Shils and Henry A. Finch (Glencoe: Free Press, 1949); Paul Lazarsfeld, "Some Remarks on the Typological Procedures in Social Research," *Zeitschrift fur Sozialforschung* Vol. 6, pp. 119-139. This chapter also draws upon discussions of typological theory in Alexander L. George, "Case Studies and Theory Development: The Method of Structured, Focused Comparison," in Paul Lauren, ed., *Diplomacy: New Approaches in History, Theory, and Policy* (New York: The Free Press, 1979), pp. 58-60; and Alexander L. George and Timothy McKeown, "Case Studies and Theories of Organizational Decision Making," in *Advances in Information Processing in Organizations*, Vol. 2 (Greenwich, Connecticut: JAI Press, 1985), pp. 28-29.

ii. Kenneth Bailey identifies most of these advantages in *Typologies and Taxonomies: An Introduction to Classification Techniques* (Thousand Oaks, California: Sage Publications, 1994), pp. 11-14. Bailey also notes (and in most instances debunks) common critiques of typological theorizing (pp. 14-16); the most important critique, which we address, is that such theorizing can become unmanageably complex.

iii. For similar notions see Paul Diesing, *Patterns of Discovery in the Social Sciences* (Chicago: Aldine-Atherton, 1971); Charles Ragin, *The Comparative Method: Moving Beyond Qualitative and Quantitative Strategies* (Berkeley: University of California Press, 1987); and Daniel Little, "Causal Explanation in the Social Sciences," *Southern Journal of Philosophy* Vol. 34 Supplement (1995), pp. 31-56.

iv. Conversely, the researcher may be interested in how a particular manipulable variable, such as a specified change in interest rates, can lead to different outcomes depending on the values of other variables.

v. Alexander L. George and Richard Smoke, *Deterrence in American Foreign Policy: Theory and Practice* (New York: Columbia University Press, 1974).

vi. Indeed, as discussed below, deductive theorizing about the conjunctive effects of variables can provide some basis for predicting the dynamics of a type of case even if no historical case has yet occurred that fits this type.

vii. In this regard, there is much confusion over Weber's notion of an "ideal type." Weber described an ideal type as one that accentuates the elements that constitute the type. He notes that "in its conceptual purity . . . [it] cannot be found empirically anywhere in reality" (Weber, *Methodology of the Social Sciences*, p. 90). Bailey persuasively reads this to mean that cases close to an ideal type can be found, but these are simply not perfect or pure exemplars of the type. Bailey, *Typologies and Taxonomies*, pp. 17-20.

viii. See, respectively, Alexander L. George and William E. Simons, eds., *The Limits of Coercive Diplomacy* Second Edition (Boulder, Colorado: Westview Press, 1994); Jack Snyder and Thomas Christensen, "Chain Gangs and Passed Bucks: Predicting Alliance Patterns in Multipolarity," *International Organization* Vol. 44, No. 2 (Spring 1990), pp. 137-168; and Theda Skocpol, *States and Social Revolutions: A Comparative Analysis of France, Russia, and China* (New York: Cambridge University Press, 1979). The burden-sharing example is discussed below.

ix. Diesing, *Patterns of Discovery in the Social Sciences*.

x. Arthur Stinchcombe, *Constructing Social Theories* (New York: Harcourt, Brace, 1968), pp. 43-45.

xi. In practice, unless types are so finely grained that each case is its own type, some qualitative, ordinal, or interval variation will remain within types. Some approaches, including fuzzy set theories, also explicitly allow for variance within type, and use degrees of membership rather than exclusive nominal categories. Types in which cases are nearly or exactly the same on the attributes measured are termed “monothetic,” while those with varying degrees of membership are called “polythetic” (Bailey, *Typologies and Taxonomies*, pp. 7-8).

xii. Andrew Bennett, *Condemned to Repetition? The Rise, Fall, and Reprise of Soviet-Russian Military Interventionism 1973-1996* (Cambridge, Massachusetts: MIT Press, 1999). For an example of such a complex typology on the comparative politics of labor movements, see Ruth Berins Collier and David Collier, *Shaping the Political Arena: Critical Junctures, the Labor Movement, and Regime Dynamics in Latin America* (Princeton: Princeton University Press, 1991).

xiii. Diesing, *Patterns of Discovery in the Social Sciences*, p. 189. See also Christopher Achen and Duncan Snidal, “Rational Deterrence Theory and Comparative Case Studies” *World Politics* Vol. 41, No. 2 (January 1989), p. 157; and Stinchcombe, *Constructing Social Theories*, pp. 44-45.

xiv. We use here the standard definition of deviant cases as those whose outcomes depart substantially from the predictions of all leading theories. This is different from what might be called extreme cases, where one variable is at such an extreme value that it far outweighs other variables in determining the outcome, which may also be at an extreme value. An extreme case may allow attributing the outcome to the extreme variable and studying that variable's effects. In still other cases where all the variables reinforce one another's effects and overdetermine the outcome, the outcome may be at an extreme but not unexpected level.

xv. One standard for judging whether to include inductively-derived variables in a theory is that such variables should not only explain the events or anomalies that spawned them, but offer insights into new cases, or into previously unexamined evidence from the cases from which they were derived. See Imre Lakatos, "Falsification and the Growth of Scientific Research Programs," in Imre Lakatos and Alan Musgrave, eds., *Criticism and the Growth of Knowledge* (London: Cambridge University Press, 1976), pp. 91-180. For clarification and critiques of this aspect of Lakatos's thought, see Colin Elman and Miriam Fendius Elman, eds., *Progress in International Relations Theory: Metrics and Methods of Scientific Change* (Cambridge, Massachusetts: MIT Press, 2003).

xvi. Most efforts to do systematic empirical research on the efficacy of deterrence have recognized the

difficulty of making valid determination of instances of successful deterrence. George and Smoke, *Deterrence in American Foreign Policy*, pp. 516-517.

xvii. David Dessler, "Beyond Correlations: Toward a Causal Theory of War," *International Studies Quarterly* Vol. 35, No. 3 (September 1991), p. 343, citing Richard Miller, *Fact and Method: Explanation, Confirmation, and Reality in the Natural and the Social Sciences* (Princeton: Princeton University Press, 1987).

xviii. George Downs, "Arms Races and War," in Philip E. Tetlock, et al., eds., *Behavior, Society, and Nuclear War* Vol. 2 (New York: Oxford University Press, 1975), p. 75.

xix. Giovanni Sartori, "Concept Misformation in Comparative Politics," *American Political Science Review* Vol. 64, No. 4 (December 1970), pp. 1033-53. See also David Collier and Steven Levitsky, "Democracy With Adjectives: Conceptual Innovation in Comparative Research," *World Politics* Vol. 49, No. 3 (April 1997), pp. 430-51.

xx. In fact, deductive typological theories of the kind described in the next section might alert

researchers to the ways in which extant cases, whether few or numerous, are not a representative sample of the likely frequency distribution of such cases over a longer history. Such deductive typological frameworks encourage consideration of whether some kinds of cases are logically and socially possible but have simply not yet occurred. To take a simple physical example, a researcher could use a sample of ten rolls of two dice to represent the population of possible rolls, or they could construct population estimates by looking at all possible combinations of two dice, together with estimates of their probability. Of course, this example illustrates the principle but overstates the point, as probability estimates and causal mechanisms in social phenomena are almost never as precise as those for dice.

xxi. In logic, what Lazarsfeld termed a property space is known as a “truth table.” Lazarsfeld used the term “substruction” for the process of developing a comprehensive property space, but as this term is not intuitive and has not become common, we simply talk in terms of “constructing” the property space to refer to the comprehensive delineation of all possible combinations of the variables. Lazarsfeld’s use of the term “reduction” for narrowing a property space is more intuitive and hence we retain it. For a fuller discussion of property spaces and typologies that parallels our analysis, see Charles Ragin’s insightful chapter on “Studying Cases as Configurations,” in his *Fuzzy-Set Social Science* (Chicago: University of Chicago Press, 2000).

xxii. When relevant theories are in short supply, the investigator should resort to the inductive approach.

It may also be useful to draw upon the explanatory “theories in use” of participants and of regional or functional experts, rendered into theoretical form.

xxiii. Of course, theories need not be modeled as typological theories to include both agency and structures. Also, it is not possible to causally model relationships in which there is simultaneous mutual constitution between agents and structures down to the finest level of analysis observable. If relationships between agents and structures can be separated out into temporal stages or different levels of analysis, however, they can be modeled in typological theories.

xxiv. Randall Schweller, “Bandwagoning for Profit: Bringing the Revisionist State Back In,” *International Security* Vol. 19, No. 1 (Summer 1994), pp. 72-107. Schweller does not explicitly style his theory as a typological one, but it fits this kind of theory as we have defined it.

xxv. For examples, see, respectively Alexander L. George, *Presidential Decisionmaking in Foreign Policy: The Effective Use of Information and Advice* (Boulder, Colorado: Westview Press, 1980); Stephen Walt, *Revolution and War* (Ithaca: Cornell University Press 1996); and Helen Milner, *Interests, Institutions, and Information: Domestic Politics and International Relations* (Princeton:

Princeton University Press, 1997).

xxvi. Another important issue in the conversion of variables into typological theories is the question of where to put the partitions between typological categories. In other words, typologies use interval variables, such as “high,” “medium,” and “low,” rather than continuous variables like those used in quantitative studies. The case studies themselves can give a nuanced analysis of what the variables actually were in a given case, but the typological theory must necessarily be more approximate and general. The partitions between typological categories should be placed such that the underlying theories predict the highest differential between the probabilities of the specified outcomes on either side of the partition. This may be difficult to do in practice, and the researcher must be alert to whether the underlying theories or their expected interactions produce “threshold effects,” or discontinuous jumps in the relationship between the magnitudes of the independent and dependent variables, and/or “inflection points,” or values at which the relationship between independent and dependent variables may reverse in direction, from a direct relationship to an inverse relationship, or vice-versa.

xxvii. Intervening variables should not be included in constructing a typological theory, though they may be important sources of data for process tracing.

xxviii. Gary King, Robert Keohane, and Sidney Verba, *Designing Social Inquiry: Scientific Inference in Qualitative Research* (Princeton, New Jersey: Princeton University Press, 1994).

xxix. In one sense, this provides an answer to the important question, “What is this a case of?” See Howard Becker and Charles Ragin, eds., *What is a Case? Exploring the Foundations of Social Inquiry* (New York: Cambridge University Press, 1992), p. 6.

xxx. Two points are worth noting here from our experience in urging students and colleagues to construct typological theorizing. First, the process of visually arraying variables into types shifts theorizing from univariate thinking on causal mechanisms, and a focus on the explanatory weight of individual variables and “alternative hypotheses,” to typological thinking and a focus on combinations of variables and their effects. Second, we have often found that graduate students constructing a typological theory for the first time discuss variables in their text that they do not include in their typological table, or include variables in the table that they do not discuss in their text. This suggests that by fostering more systematic thinking about theories and the contexts in which they apply, typological theorizing can quickly point out inconsistencies in a theorist’s views.

xxxi. This discussion assumes that cases may be selected on the basis of preliminary knowledge of the

values of their variables. Of course, the values of the variables may turn out to be different once the researcher undertakes the actual case study. A finding that a case has commonly been mis-classified is an important contribution. This is one reason that the selection of cases based on preliminary knowledge of the values of the variables is not necessarily vulnerable to confirmation bias.

xxxii. Daniel Little, "Causal Explanation in the Social Sciences."

xxxiii. In some circumstances, statistical tests may be misleading if particular combinations of variables are impossible but the researcher is not aware of this. For example, a 2x2 table in which one square is not possible gives misleading results when a chi-squared test is applied. We thank Bear Braumoeller for providing this insight in private correspondence.

xxxiv. It is useful to distinguish here between cases that are not logically possible and those that are not socially possible or at least highly unlikely in the social world. A logically impossible case would be a case of deterrence "success" when either no deterrent threat was issued or no action was contemplated in the first place by the state that was supposedly challenging the status quo. By definition, such cases do not constitute successful deterrence. A case that is socially impossible, or at least highly unlikely, is one in which all of the relevant variables, both singly and conjunctively, point in the same direction in over-determining an outcome, yet that outcome does not occur. Except for measurement error or the

existence of a strong but probabilistic causal mechanism, if such a case exists it indicates the presence of a left-out variable. We thank Bear Braumoeller for clarifying this distinction.

xxxv. Bailey, following Lazarsfeld, suggests eliminating all empty cells (*Typologies and Taxonomies*, p. 27; Lazarsfeld termed this process “functional reduction”). In our view, such reduction should not be automatic, as the researcher needs to first consider whether the theory dictates that the cell should be empty, and whether some overlooked historical case might fit it.

Lazarsfeld’s other modes of reduction are “pragmatic,” which collapses contiguous types, and “arbitrary numerical,” which, similar to Boolean algebra and QCA, collapses types into those sharing certain combinations that might be considered sufficient for the outcome (for example, we might code the habitability of a house with plumbing and no heat or refrigerator as the same as that of a house with heat and a refrigerator but no plumbing; Bailey, *Typologies and Taxonomies*, pp. 27-28). For our purposes, we find more useful principles of reduction that focus on the suitability of specified types and extant cases for alternative case study research designs.

xxxvi. For this reason, Miriam Elman’s book, *Paths to Peace: Is Democracy the Answer?* (Cambridge, Massachusetts: MIT Press, 1997) rightly includes case studies of mixed and non-democratic dyads.

xxxvii. A researcher can also examine a “typical” case (as identified by a statistical distribution or more crudely by the most populated type in a typology) to see how causal processes unfold in such a case. The most likely or extreme case corresponds with Weber’s notion of an “ideal type” case, while the typical case corresponds with John McKinney’s notion of a “constructed type” (John McKinney, *Constructive Typology and Social Theory* (New York: Appleton-Century-Crofts, 1966)). Both are examples of a “criterion” type, or a type against which other cases can be measured (Bailey, *Typologies and Taxonomies*, pp. 17-24).

xxxviii. It is also possible if, for the sake of simplicity, the types are delineated into nominal or ordinal approximations of interval variables, the variance that remains in the levels of the independent variables within the same type may account for differences in the outcomes among cases in the type. In this instance, the researcher has to decide whether to re-draw the partitions between the types, which complicates the theory, or explain the discrepancy in the narrative explanations of the cases and in a footnote to any tables presenting the typological theory.

xxxix. This treatment of “crucial” cases is somewhat different from that of Harry Eckstein, who devised the term. See Harry Eckstein, “Case Studies and Theory in Political Science,” in Fred Greenstein and

Nelson Polsby, eds, *Handbook of Political Science* Vol. 7 (Reading, Massachusetts: Addison-Wesley, 1975), pp. 118-120. Emphasis in the original. Our formulation is more precise on whether a case is most or least-likely for a particular theory, and whether alternative theories make complementary or contradictory predictions.

xl. Daniel Little, while more pessimistic than we are on the possibilities for typological theorizing, concurs that such theorizing can be strengthened by process tracing. As an example, Little notes that Theda Skocpol's work on social revolutions, in addition to using traditional comparative analysis based on Mill's methods, uses established social theories in this manner. Daniel Little, "Causal Explanation in the Social Sciences," p. 54.

xli. Alexander L. George and Richard Smoke, "Deterrence and Foreign Policy," *World Politics* Vol. 41, No. 2 (January 1989), pp. 170-182; Robert Jervis, "Rational Deterrence: Theories and Evidence," *World Politics* Vol. 41, No. 2 (January 1989), pp. 183-207.

xlii. We therefore disagree with the criticism that case study methods do not account for interaction effects (Stanley Lieberson makes this critique in "Small N's and Big Conclusions," in Charles Ragin and Howard Becker, *What is a Case?* pp. 109-113). For a view that concurs with our emphasis on the

ability of case study methods to incorporate interactions, see Charles Ragin, *The Comparative Method*.

xliii. Andrew Bennett, Joseph Leggold, and Danny Unger, "Burden-Sharing in the Persian Gulf War," *International Organization* Vol. 48, No.1 (Winter 1994), pp. 39-75.

xliv. Andrew Bennett, Joseph Leggold, and Danny Unger, eds., *Friends in Need: Burden-Sharing in the Persian Gulf War* (New York: St. Martin's Press, 1997).

xlv. In brief, the theory's explanation for why the second Gulf War's coalition was much narrower than that in the first war is that in the second war there was a much weaker consensus that removing the Iraqi regime was a public good, states were tempted to ride free and reduce the terrorist threat to themselves by not contributing, security dependence on the United States was much lower by 2003 because a resurgent Russian threat was less likely than in 1991, Iraq posed less of a conventional military threat to the region than in 1991, and the domestic politics in many countries made contributions less likely due to rising anti-Americanism.

xlvi. Daniel Little, "Causal Explanation in the Social Sciences."