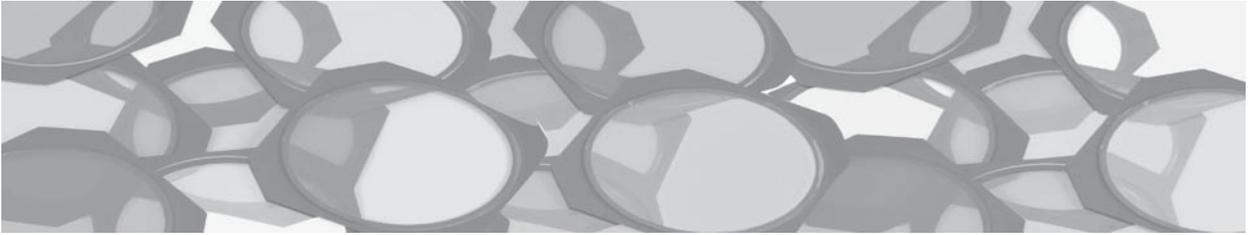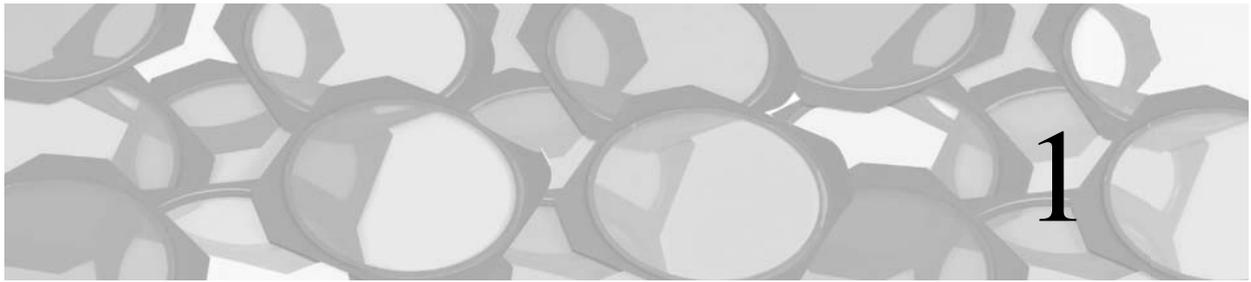# Methods and Fields of Comparative Politics

1

The Distinctiveness of Comparative Research

Charles C. Ragin and Claude Rubinson

INTRODUCTION

Social research is inherently comparative (Lieberson, 1985). Researchers compare the relative effects of variables across cases; they compare cases directly with one another; and they compare empirical cases with counterfactual cases. But the *comparative method* – sometimes referred to as 'small-N comparison' – constitutes a distinctive approach to understanding social phenomena. Frequently, comparative methods are portrayed as a 'bridge' between qualitative, case-oriented research and quantitative, variable-oriented research. This interpretation is certainly valid. By embracing aspects of both qualitative and quantitative methods, comparative methods can circumvent some of the limitations of both approaches. But comparative research is not merely a bridge, for it has many distinctive features and strengths.

We begin this chapter by reviewing the conventional view of comparative methods as simultaneously qualitative and quantitative. The moderate number of cases employed by comparative researchers allows them to engage in the development, testing, and revision of theory – traditionally the province of case-oriented research, as well as hypothesis testing and theory adjudication – usually seen as the province of variable-oriented research. But the greatest strengths of comparative methodology arise from its distinctiveness. Fundamentally *set theoretic* in nature, comparative methods presuppose particular epistemological and theoretical perspectives (Ragin, 1987; 2000; Rubinson and Ragin, 2007). Although social researchers conventionally conceive of social reality in terms of tendencies and probabilities, social scientific theory – like comparative research – is predominately set theoretic in nature. Frequently, however, even comparative researchers do not recognize the set theoretic character of their work.

In the second part of this chapter, we explicate the set theoretic nature of a number of classic comparative studies. We identify and illustrate three types of set theoretic relationships and discuss how they form the basis of three forms of comparative analysis: descriptive, constitutive, and causal. Next, we discuss the case-oriented nature of social research.

The set theoretic orientation of comparative research invokes a case-oriented perspective: sets are composed of elements (cases) and comparative research is the analysis of how cases in one set relate to cases in another set. We then discuss the issue of causal complexity. Comparative methods are especially well-suited for the study of how combinations of causal conditions produce particular outcomes. The study of necessary and sufficient conditions – a prominent concern among comparativists – is but one aspect of comparative causal analysis.

We conclude our discussion of comparative research by examining its formal methods. Reviewing two contemporary applications of comparative methodology, we illustrate the construction and analysis of truth tables. Truth tables form the foundation of comparative analysis; whether explicitly or implicitly, most comparative researchers construct truth tables. We demonstrate how Mill's (1875) methods of agreement and difference as well as Ragin's Qualitative Comparative Analysis (QCA) – the two dominant implementations of formal comparative methods – make use of them. QCA builds upon and extends Mill's methods, as we demonstrate through analyses of causal complexity and counterfactual cases.

COMPARATIVE METHODS AS A BRIDGE

In describing the methodological landscape of the social sciences, it is conventional to distinguish between quantitative, variable-oriented analysis and qualitative, case-oriented analysis (Ragin, 1987). There is, of course, no inherent reason that variable-oriented analysis must be quantitative and case-oriented analysis, qualitative (Rubinson and Ragin, 2007). Still, there is a natural affinity, which is a consequence of the way in which the number of cases influences the research process. Quantitative techniques require a large number of cases – the more, the better – so as to meet model assumptions

and enhance statistical power (Cohen, 1988). Faced with hundreds or thousands of cases, however, it is impossible for researchers to know the details of each case. As the cases become obscured and retreat to the background, variables advance to the fore. Large-N analysis, then, tends to focus on variables and their relationships.

The fundamental goal of variable-oriented research is the production of descriptive or explanatory inferences (Brady, 2004). Descriptive inferences are produced by generalizing from patterns found within samples (King et al., 1994). All else being equal, the larger a sample is the greater the researcher's confidence in generalizing to a wider population. Explanatory inferences are produced through hypothesis testing (King et al., 1994). Hypothesis testing requires a well-specified theory of the relationships among variables, which may be confirmed or refuted by comparing the theory's predictions against evidence. Again, all else being equal, the larger the sample, the greater the researcher's confidence that a relationship found in a sample does, in fact, exist in the wider population. As both benefit from a large number of observations, the affinity between variable-oriented research and quantitative methods is mutually reinforcing.

Case-oriented research and qualitative methods, by contrast, are most useful when applied to a small number of cases. Because qualitative techniques leverage the researcher's in-depth knowledge of cases, every additional case requires researchers to further divide their attention. Examination of details highlights the distinctiveness of each case. While imposing limits on generalization and thereby hindering hypothesis testing, this focus facilitates theory development (George and Bennett, 2005). In-depth case knowledge makes it easier to see which case aspects are relevant to the question at hand and how these aspects fit together. This understanding may be used to construct new theory or revise existing theory, thus generating new hypotheses for future testing.

This is not to say that case-oriented researchers cannot engage in hypothesis testing;

indeed, popular examples of case-oriented research include 'crucial,' 'most-likely,' and 'least-likely' case studies that test whether a theory operates as predicted (Eckstein, 1992). In general, however, researchers who want to develop new theory tend to use qualitative, case-oriented techniques to examine small-Ns, while those who want to test theory tend to apply quantitative, variable-oriented methods to large-Ns (Ragin, 1994). A consequence of this bifurcation is that social research is characterized by a large number of studies that examine either small-Ns or large-Ns, but relatively few studies that examine a moderate number of cases (Ragin, 2000: 25).

Comparative research can bridge the divide between qualitative, case-oriented research and quantitative, variable-oriented research. Like case-oriented methods, comparative methods maintain the integrity of cases; like variable-oriented methods, comparative methods examine patterns of relationships among variables. Comparative methods, then, may be used for both theory development and hypothesis testing. With a moderate number of cases (usually around 5–50), it becomes possible to examine cross-case patterns while still attending to the details of each case. In comparative research, theory development and hypothesis testing interact in two ways. First, comparative methods may be used to develop, test, and revise a particular theory. Second, comparative methods may be used to adjudicate between competing theories.

Developing, testing, and revising theory

Comparative methods encourage a reciprocal relationship between theory development and theory testing. In a strictly qualitative case-oriented study, researchers enter the field armed only with sensitizing concepts, which they use to help them construct new theory as they try to make sense of their cases. In a purely quantitative variable-oriented study, researchers begin their research armed with a well-specified theoretical model and hypotheses regarding how change in one variable affects changes in others. In contrast to these two extremes, comparativists typically begin their research with a rough idea of the concepts, variables, and cases that are likely to be relevant to their research question. Because comparative researchers typically study a moderate number of cases, it is not feasible to use a purely exploratory approach and conduct an open-ended, in-depth examination of every case. At the same time, conventional hypothesis testing fails due to the limited degrees of freedom available. Instead, comparative researchers seek to answer their research questions by examining the fit between concepts and cases, ideas and evidence. The notion of 'fit' is key. For comparativists, a good theory is a middle-range theory that fits the evidence well (Mjoset and Clausen, 2007). Such a theory will identify which variables are relevant to the question at hand, explain how these variables are related to one another, and, specify the contexts under which they operate.

Through investigation of the fit between theory and data, comparativists discover areas for adjustment and improvement. Ultimately, the resulting theory must be judged on its own merits. Does the theory provide a compelling explanation of the observed cases? Does it explain unobserved or previously anomalous cases? Does it produce observable implications and novel insights? Is it falsifiable? There is always a trade-off between specificity and generality, and theories vary in their explanatory scope. Very specific theories may not generalize beyond the observed cases; very general ones may not add anything new to our understanding. Ultimately, whether any particular theory is successful depends upon striking the proper balance between specificity and generality for the research question at hand. The advantage of using comparative methods to develop, test, and revise theory is that they make these choices, considerations, and decisions explicit.

Adjudicating between theories

A popular use of quantitative methods is to adjudicate between competing theoretical perspectives. Given two or more theories that purport to explain the same phenomenon, researchers identify the variables specified by each theory and estimate a series of models using the same dataset. By examining measures of statistical significance, explained variation, and model fit, researchers can determine which theory best explains the outcome of interest.

Comparative methods may be applied to this purpose as well. While the process tends to differ, the logic is the same. As the goal of hypothesis testing is the generation of explanatory inferences (see above), the construction of the set of relevant cases is crucial. Because comparativists study fewer cases than quantitative researchers, they typically devote much more attention to the task of delineating the set of relevant cases and then constructing their datasets. Of particular concern are scope and possibility conditions. *Scope conditions* specify the conditions under which a theory is relevant (Cohen, 1989). Cases that do not meet a theory's scope conditions are considered irrelevant, regardless of whether they exhibit the outcome of interest. Skocpol (1979), for example, limits her theory of the causes of social revolutions to countries without a recent history of colonial domination and thereby excludes the cases of Mexico and Vietnam. *Possibility conditions* specify the conditions under which an outcome is possible (Goertz, 2005; Mahoney and Goertz, 2004). For example, there are many (in fact, infinite) cases of the *non-occurrence* of social revolutions. When the outcome of interest is clearly impossible, the case is irrelevant for the theory at hand. Irrelevant cases should be excluded from the data set because their inclusion does not benefit hypothesis testing and, indeed, may hinder it (Braumoeller and Goertz, 2002; Clarke, 2002; Mahoney and Goertz, 2004). Mahoney and Goertz (2004) codify the specification of possibility conditions – that is, whether cases are considered relevant or not – as the 'possibility principle.'

Given an initial set of cases, the researcher first examines scope conditions in order to exclude cases to which the theory does not apply. The researcher then applies the possibility principle in order to restrict the sample to relevant cases. Mahoney and Goertz (2004) operationalize the possibility principle as a rule of exclusion and a rule of inclusion. The exclusion rule, which takes priority over the inclusion rule, directs the researcher to develop a list of 'robust eliminatory variables' which predict the absence of the outcome. Cases are excluded as irrelevant 'if their value on any eliminatory independent variable predicts the nonoccurrence of the outcome of interest' (Mahoney and Goertz, 2004: 658). The inclusion rule states that '[cases are relevant if their value on at least one independent variable is positively related to the outcome of interest' (Mahoney and Goertz, 2004: 657). We regard this threshold as a preliminary guideline and recommend that researchers use their theoretical and substantive knowledge when specifying inclusion thresholds.

The proper application of scope conditions and the possibility principle to a population will produce a theoretically and substantively relevant sample of both positive and negative cases. If the resulting sample is too large for comparative analysis, then researchers should select representative cases that maximize the diversity of cases on relevant causal conditions. To adjudicate among competing theories, the comparative researcher examines each case to see if the relationships between causal conditions and outcomes hold as predicted by each theory. Theories are evaluated according to how well they predict both the presence and absence of the outcome. Like conventional quantitative adjudication techniques, comparative techniques of adjudication can indicate opportunities for theory refinement by exposing the ways in which different theories complement one another and might be combined.

Example: Berg-Schlosser and de Meur's (1994) 'Conditions of Democracy'

Social scientists have a longstanding interest in the rise and evolution of democracy and have developed a wide array of theoretical explanations for its emergence, persistence, and breakdown. Observing that there have been few attempts to adjudicate among these theories, Berg-Schlosser and de Meur (1994) test eight of the most prominent models predicting the success or failure of democratization: Dahl (1971, 1989), Hermens (1941), Linz (1978), Lipset (1981), Luebbert (1987), Moore (1966), Sani and Sartori (1983), and Vanhanen (1984). Berg-Schlosser and de Meur (1994) construct their dataset by drawing from the inter-war period in Europe, emphasizing the similarities among the cases:

> For a study of the chances and failures of democracy in a comparative perspective, the interwar period in Europe provides a unique setting, since the cases to be considered share many common socioeconomic and political-cultural characteristics. Their history is relatively well researched and well documented. The time period under consideration is clearly demarcated by common events, the two world wars which significantly altered both the internal and external political landscapes and set them apart from earlier and later developments. All cases can initially be designated as parliamentary democracies, some of them relatively well established, others more recent, and some existing more in form than in substance. They were subsequently affected by a common external stimulus, the world economic crisis of the late 1920s and early 1930s. Some parliamentary regimes survived, while others yielded to authoritarian rule and, in particular, fascism. Prevailing assumptions concerning modernization and progress, whether liberal or Marxist, were severely shattered (1994: 253).

The theories under investigation were developed primarily through the examination of Western European countries, and it is not clear that they should also apply to non-Western societies. In order to satisfy scope conditions, Berg-Schlosser and de Meur (1994), therefore, restrict their sample to 16 Western European countries. The limited time period seeks to satisfy possibility conditions. All of the countries in the sample entered the period as parliamentary democracies and

were subjected to the same historical events. That some emerged as democratic and others as authoritarian suggests that each country possessed the potential for democratic breakdown. Expanding the sample beyond the small handful normally examined in comparative research provides a test of the generalizability of the theories: 'all of the major "breakdown" cases with their specific patterns and the major "survivors," including some of the smaller countries which often tend to be overlooked, are considered' (Berg-Schlosser and de Meur, 1994: 254). At the same time, the moderate sample size permits Berg-Schlosser and de Meur to interrogate the individual cases when seeking to make sense of results. Indeed, to this end, the researchers exclude certain countries from the sample: 'cases like Denmark and Norway have not been included because they were found to add relatively little variation over and above the conditions and relevant factors for a case like Sweden' (Berg-Schlosser and de Meur, 1994: 254). In contrast to conventional quantitative methods, the inclusion of additional cases in comparative research is of no benefit unless they serve to better represent the combinations of conditions present in the population: Berg-Schlosser and de Meur's 1994 sample is representative not of Western European countries during the inter-war period per se but, rather, of the *types* of countries that existed in Western Europe at that time.

For each theoretical model, Berg-Schlosser and de Meur (1994) examine whether the countries in their sample conform to the model's predictions of democratic survival versus breakdown. A model is confirmed when it correctly predicts the survival or breakdown of democracy. The attention to individual cases permits the researchers to identify cases that partially support or contradict a model's hypothesis as well. Comparing the successes and failures of each theory, Berg-Schlosser and de Meur find the strongest support for, first, structural models that emphasize socioeconomic conditions and, second, agency models that emphasize the

actions of individual actors. Institutional and meso-level models are only weakly supported. Complex models incorporating nine or more independent variables were more likely to produce mixed results, a consequence of the diversity present among cases. Applying QCA (Ragin, 1987) to simplify their results, Berg-Schlosser and de Meur (1994: 276) find the most parsimonious solutions to emphasize 'basic factors like democratic legitimacy and the political role of the military (as with Dahl) together with some actor-related aspects like interventions by members of the upper class (for Linz)'.

Perhaps the most significant finding, however, is that the emphasis on historically important cases such as Great Britain, Germany, Italy, and Spain has, in fact, hindered understanding of democratic persistence and breakdown:

> But it can also be seen that countries like Finland, Czechoslovakia, Greece, and even France are hardly in line with the expectations of any of the theorists and in several instances provide direct counterfactual examples. This result points to the often rather limited perspective in theory building of some of these authors as far [as] geographical distribution and historical depth are concerned (Berg-Schlosser and de Meur, 1994: 276).

Bridging the worlds of case-oriented and variable-oriented analysis, comparative methods make it possible for Berg-Schlosser and de Meur to adjudicate among competing theories, examine relations among explanatory variables, and identify cases that contradict specific theories.

THE DISTINCTIVENESS OF THE COMPARATIVE METHOD

The greatest strengths of the comparative method arise from its distinctiveness, not from its facility for bridging variable-oriented and case-oriented analysis. Social researchers traditionally conceive of social reality in terms of tendencies and probabilistic relationships. That is, we generally frame

our observations in a contingent manner: 'Given certain conditions, a given effect is *likely* to occur.' In this view, social reality is inherently random and all social processes embody a stochastic component that cannot, even in principle, be identified, much less modeled (Goldthorpe, 2000: chapter 7). The most formal versions of this approach are found in probabilistic models – such as regression analysis – that produce precise predictions of the likely effect of one variable upon another. In contrast to the tendential conception of social reality, comparative methods see the social world in terms of sets and set theoretic relations, especially those that are consistent with arguments of causal necessity or sufficiency. This view motivates a search for invariant or at least highly consistent connections between causal conditions and outcomes.

Set theory in comparative research

Although the tendential view of reality dominates social scientific discourse, most social scientific theory invokes a set theoretic notion of reality. For example, when researchers observe that 'religious fundamentalists are politically conservative' they are arguing that religious fundamentalists form a rough subset of the set of political conservatives. Another example: Esping-Andersen (1990) proposes a set theoretic model of the nation-state. Liberal, corporatist, and social democratic countries are each a subset of the welfare capitalist countries; together, they constitute a complete set: *The Three Worlds of Welfare Capitalism.* Capitalist countries are not necessarily welfare states, however. Esping-Andersen uses the term 'welfare' as a modifier, indicating that welfare states are a subset of capitalist countries. And capitalist countries are, in turn, a subset of *all* countries.

Types of set theoretic connections

The existence of a set theoretic relationship indicates that some type of connection may link distinct phenomena. This connection can take

one of three basic forms: descriptive, constitutive, or causal. Consider, for illustration, the opening observation that motivates Weber's investigation of *The Protestant Ethic and the Spirit of Capitalism*: 'the fact that business leaders and owners of capital, as well as the higher grades of skilled labour, and even more the higher technically and commercially trained personnel of modern enterprises are overwhelmingly Protestant' (1958: 35). The puzzle that motivates Weber's analysis is explaining the fact that people in these occupations constituted a rough subset of the set of Protestants. His observation is not simply that there is an 'association' between two variables, but that a specific *connection* – between certain occupations and Protestantism – is remarkably consistent (they are 'overwhelmingly' Protestant). He goes on to query: '[W]hy were the districts of highest economic development at the same time particularly favourable to a revolution in the Church?' (Weber, 1958: 36). Weber notes, in effect, that these highly developed districts constitute a subset of those opposed to the Catholic Church – that again there is a remarkably consistent, almost uniform, connection. As first presented by Weber, these two set theoretic connections are primarily *descriptive* in nature because he says nothing about why these connections exist.

Weber's goal in *The Protestant Ethic* is to unravel the puzzle of the set-theoretic connections between capitalism and Protestantism. Defining the spirit of capitalism as the methodical, continuous pursuit of profit, Weber begins by elucidating the relevant characteristics of modern capitalism: rational calculation, entrepreneurs, credit markets, the separation of work and home, and double-entry accounting (Weber, 1958: 17–22).[1] Each of these conditions, however, has existed before and, therefore, cannot be solely responsible for capitalist exchange. It is only with the rise of the labor market – 'the rational capitalistic organization of (formally) free labour' (Weber, 1958: 21) – that these conditions take on a modern, capitalistic character:

> For without the rational capitalistic organization of labour, all this, so far as it was possible at all,

would have nothing like the same significance, above all for the social structure and all the specific problems of the modern Occident connected with it. Exact calculation – the basis of everything else – is only possible on a basis of free labour (1958: 22).

Weber's model of capitalism, then, is a combination of six essential conditions. Such a model is *constitutive*: the elements of the model are closely intertwined and together constitute rational capitalism. For example, double-entry accounting 'is also found in the Far East, the Near East, and in antiquity' (Weber, 1958: 22) but contributes to 'the continual pursuit of profit' only when combined with free labor.

Whenever a set-theoretic connection is interpreted as evidence that something is an 'essential' component, aspect, or part of another, it may be viewed as *constitutive*. Whether a set-theoretic relation is seen as evidence of a *constitutive* versus a *causal* connection is a matter of interpretation. For example, some might interpret the fact that the advanced industrial societies are uniformly democratic as evidence that 'economic development is *causally sufficient* for democratic government.' Others, however, might avoid making a causal argument and interpret this same connection as evidence that having a democratic government is an *essential part* of being an advanced industrial society. The key distinction is in how the connection is understood and interpreted.

Constitutive analysis is central to what Ragin (1992) has referred to as the process of 'casing.' Researchers engage in casing whenever they attempt to delineate the conceptual boundaries of a case or set of cases. Researchers often engage in casing as they attempt to identify conceptually the observations included in their analyses. In *The Protestant Ethic*, Weber's primary concern is the casing of rational capitalism. He asks, 'What is rational capitalism? How is it different from other economic systems?' Casing seeks to answer the questions, 'If I see it, how will I know?' 'What are its essential elements?'

An important aspect of casing is that it identifies the theoretically *salient* characteristics of the case. That capitalism involves exchange for gain is not salient because exchange for gain exists everywhere, at all times (Weber, 1958: 17). Exchange for gain may be central to rational capitalism but, theoretically, it is not decisive. The separation of work and home, however, has much greater theoretical salience. Although the 'spatial separation of places of work from those of residence exists elsewhere' (Weber, 1958: 22), it is only under conditions of capitalism that this separation forces workers to seek their livelihood on the labor market: 'The tendency everywhere else was for acquisitive enterprises to arise as parts of a royal or manorial *household* (of the *oikos*), which is, as Rodbertus has perceived, with all its superficial similarity, a fundamentally different, even opposite, development' (Weber, 1958: 22, emphasis in original). Thus, constitutive analysis seeks to identify the interconnected components of a type of case – its essential features. It produces a litmus test for membership in the set of cases under observation. An observation is excluded if it lacks any of the essential features or displays any feature that is prohibited.

Having outlined the characteristics of modern capitalism, Weber observes that modern capitalism first took root in Protestant-dominated regions. That is to say, the set of regions where modern capitalism arose are a subset of the set of Protestant countries. To establish a *causal* connection, Weber seeks to link the rise of Protestantism with the rise of modern capitalism:

> Montesquieu says (*Esprit des Lois*, Book XX, chap.7) of the English that they 'had progressed the farthest of all peoples of the world in three important things: in piety, in commerce, and in freedom'. Is it not possible that their commercial superiority and their adaptation to free political institutions are connected in some way with that record of piety which Montesquieu ascribes to them? (1958: 45)

To establish causality, researchers must specify the mechanism by which membership in one set is connected to membership in another. Weber does this by linking Luther's conception of the calling to the spirit of capitalism. By describing how the sense of calling combined with a worldly asceticism led Protestants to embrace capitalist production and exchange, Weber details how membership in one set (people possessing the Protestant ethic) connects to membership in another (people possessing the spirit of capitalism). Note that Weber does not claim that all Protestants embraced capitalism, nor does he claim that all those who embraced capitalism were Protestant. That is, Weber does not argue for the existence of a perfect subset relationship at the individual level but rather an affinity between the two. The two rough subset relations described at the outset of this discussion are evidence of this affinity.

Set theory and within-case analysis

Social researchers use the term 'case study' in a variety of ways (Ragin and Becker, 1992). Frequently, comparative research is subsumed under the term (e.g., Gerring, 2007: chapter 2). However, we find it useful to distinguish between within-case analysis (i.e., single case studies) and cross-case analysis (i.e., comparative studies) as each of these forms of analysis entails distinct research methods. Within-case analysis focuses on singular cases. Many researchers feel that because single-case studies lack a comparative element, they are not 'real research.' We disagree. Case studies are particularly useful in interpreting culturally or historically significant phenomenon (Ragin, 1994). Case studies of events such as the storming of the Bastille (Sewell, 1996), the funeral of Abraham Lincoln (Schwartz, 1991), and the rise of the English working class (Thompson, 1966) are valuable because they apply social science theory and concepts to the study of the causes and consequences of important moments of historical transformation or qualitative change.

Moreover, case studies are not necessarily non-comparative. There is a crucial distinction between the unit of analysis and the unit

of observation (Denton, 2007). Unfortunately, social researchers often use the term 'case' to refer to both. As King et al. (1994) point out, a single case study may involve many observations. Thompson (1966), for example, uses a variety of methods to examine and synthesize data from a variety of sources in order to explain the emergence of English working class consciousness. Today it is fashionable to refer to such research as 'triangulated' or 'multi-method' (Brewer and Hunter, 2006; Reinharz, 1992), but case study researchers have always leveraged a variety of data sources and analytic techniques in order to confirm their findings and make sense of their cases. As cases exist in space and across time, implicit – if not explicit – comparisons are inevitable. Thompson's study covers 50 years and spans the whole of the country. He invites comparison of the English workers by including separate chapters on field laborers, artisans, and weavers. Likewise, his examination of worker responses compares various forms of resistance, protest, and working-class radicalism. By the conclusion of the text, Thompson has reviewed the cultural and structural transformations between 1780 and 1832 that gave rise to class consciousness among English workers. Thompson's project may be understood as a comparison between the working class of 1780, a class *an sich*, and the working class of 1832, a class *für sich*.

Finally, within-case analysis is an essential component of good cross-case, comparative research. It is for this reason that some researchers subsume comparative research under the moniker of 'case study.' Good cross-case comparison necessarily involves the investigation of individual cases on their own terms. Indeed, a common method of presenting comparative research is exemplified by Barrington Moore, Jr. (1966) in *Social Origins of Dictatorship and Democracy*. Moore spends the bulk of the text reviewing the individual cases (that is, conducting within-case analysis) and offers systematic comparative analysis at the conclusion. It is here that Moore constructs his

three routes to modernity; that is, his three sets of modernizing revolutions. The set of bourgeois revolutions culminating in democracy include the cases of the French Revolution and the English and American civil wars. The set of conservative revolutions culminating in fascism include the cases of Japan's Meiji Restoration and Bismarck's unification of Germany. Finally, the set of peasant revolutions culminating in communism include the Russian and Chinese revolutions. In turn, these three sets of revolutions constitute a subset of what might be termed 'modernizing revolutions.'

Hobsbawm (1967) observes that '[t]he author of a comparative analysis does not compete with the specialists; he exploits them and may have to question them.' (p. 821) Within-case and comparative studies are complementary. The set theoretic nature of comparative research requires the conduct of within-case analysis, as sets are all about cases – the elements contained within sets – and the characterization of cases in terms of set memberships.

Causal complexity in comparative research

Conventionally, researchers do not present their causal arguments in terms of set relations but, rather, in terms of how causes come together to produce outcomes. Moore (1966), for example, speaks of 'three routes to the modern world,' and Skocpol (1979) discusses social revolutions as the product of state breakdowns and peasant revolts. Neither author makes their sets explicit, and frequently it takes some effort to discern the set relations. However, close analysis of most comparative work reveals a conjunctural understanding of causation. In essence, causal conjunctures involve intersections of conditions, which in turn can be understood as set intersections.

Moore (1966), for example, identifies five conditions for the development of democracy.

1. The development of a balance to avoid too strong a crown or too independent a landed aristocracy.
2. A turn toward an appropriate form of commercial agriculture.
3. The weakening of the landed aristocracy.
4. The prevention of an aristocratic-bourgeois coalition against the peasants and workers.
5. A revolutionary break with the past. (pp. 430–31).

Each of these items involves a process of transformation: 'development,' 'turn,' 'weakening,' 'prevention,' 'break.' When these processes are found together, they constitute a 'bourgeois revolution' which is one form of 'modernizing revolutions.' However, Moore's unit of observation is not the modernizing revolution – that is his unit of analysis – but, rather, individual countries. Countries that experienced the combination of these processes, such as England, France, and the United States, are found in the set of countries that experienced bourgeois revolutions. Countries that did not experience each of these processes, such as India which lacked a revolutionary break with the past, are not found in the set of countries that experienced bourgeois revolutions. Moreover, India is not found among the set of countries that experienced modernizing revolutions of any form (bourgeois, conservative, or peasant), which according to Moore explains its long-term stagnation (Moore, 1966: chapter 6).

Skocpol's subtitle – *A Comparative Analysis of France, Russia, and China* – immediately reveals countries as her units of observation. Searching for necessary and sufficient conditions of social revolution, Skocpol uncovers important subset relations. First, countries that experience social revolution are a subset of countries that experience state breakdown *or* peasant revolt. Second, countries that experience state breakdown *combined with* peasant revolt are a subset of countries that experience social revolution. The first relationship – in which the outcome is a subset of the cause – identifies a relationship consistent with necessity; the second relationship – in which the cause is a subset of the outcome – identifies one that is consistent with sufficiency.

The study of necessity and sufficiency is a longstanding interest of comparative researchers (Goertz and Starr, 2003). A cause is necessary when the set of cases exhibiting the cause (e.g., state breakdown) includes the entire set of cases exhibiting the outcome (e.g., social revolution), The presence of state breakdown is a necessary condition for the occurrence of social revolution. A cause is sufficient when the set of cases exhibiting the outcome (e.g., social revolution) includes the entire set of cases exhibiting the cause or, more commonly, a combination of causes (e.g., the combination of state breakdown *and* peasant revolt). The combined presence of state breakdown and peasant revolt is a sufficient condition for the occurrence of social revolution.

Complex conditions of necessity and sufficiency can combine to form what Ragin (1987) calls 'multiple conjunctural causation.' Multiple conjunctural causation exists when a single causal condition is neither necessary nor sufficient to produce the outcome on its own but, rather, only in combination with other causal conditions. Re-examining Gamson's (1990) social protest data, for example, Ragin (1989) finds that challenging groups (social movement organizations) secure new advantages for their constituents if they satisfy any one of the following combinations of causal conditions.

1. No bureaucratic organization, middle or mixed strata constituents, no help from outsiders, and acceptance by antagonists.
2. Middle or mixed strata constituents, non-displacement goals, and help from outsiders.
3. Bureaucratic organization, lower strata constituents, non-displacement goals, and acceptance by antagonists.
4. Non-displacement goals, help from outsiders, and acceptance by antagonists (pp. 392–93).

While any one of these combinations of conditions will result in the challenging group securing new advantages, there is no individual cause common to all combinations. Mackie (1974) refers to such causes as

INUS causes because each is an Insufficient (not sufficient by itself) but Necessary component of a causal combination that is, itself, Unnecessary (due to multiple paths) but Sufficient to bring about the outcome.

METHODS OF COMPARATIVE ANALYSIS

Comparative analysis can be formalized through the construction of truth tables, which show the connections between different combinations of conditions and an outcome (Ragin, 1987; 2000). Although conventional datasets may be used in their construction, the columns of a truth table do not represent variables, per se, nor do the rows represent cases. Rather, the columns of a truth table represent sets and the rows represent relationships among sets, specifically, all logically possible intersections among the relevant sets. These intersections may be understood as representing logically possible combinations of causal conditions. Comparative research is the study of the connections between combinations of conditions and outcomes. Whether implicitly or explicitly, comparative researchers construct truth tables when they examine how causal conditions relate to specific outcomes.

To illustrate the construction of a truth table, we review Brown and Boswell's (1995) analysis of how split labor markets affected interracial strikebreaking and solidarity during the 1919 steel strike. After conducting case studies of 16 northern cities,[2] Brown and Boswell (1995) use comparative methods (specifically, crisp-set QCA) to identify three causal conditions that explain four forms of interracial strikebreaking.[3] To simplify our discussion, we review just one of their outcomes: the presence of black strikebreaking in the face of white worker solidarity.

Brown and Boswell (1995) begin their analysis by constructing a sample of cities that participated in the strike:

Our unit of analysis is the steel-producing communities where relevant variation in race relations

occurred. Cities in the analysis have the following characteristics in common: the population was over 25,000, the steel industry was an important employer, black workers were a significant part of the steel workforce, and the recruitment efforts of the national committee reached each location during the organizing drive. We selected cases from Foster's (1920) account of the organizing drive and include only those locations that actually participated in the strike. The final group of 16 cases ranges in size from single-industry towns to major multi-industry cities. (1995: 1497–98)

By conducting a case study of each city in the sample, Brown and Boswell produce the data set shown in Table 1.1.[4] 'Recent black migration' is an indicator of whether the city has recently experienced a large increase in its population of young, single, black males. A city is considered to have a weak steelworkers union ('Weak union') if the union had previously suffered a failed strike against US Steel (the primary target of the 1919 steel strike). 'Political repression' exists when local governments align themselves with capital rather than labor.

These three causal conditions were not the only conditions that Brown and Boswell (1995) examined. Their initial truth table included only two conditions, 'Recent black migration' and 'Weak Union.' However, this configuration created a 'contradiction' (Ragin, 1987: 113–118): five cities – Buffalo, Chicago, Gary, Johnstown, and Cleveland – all experienced recent black migration and a history of strong unions; however, the first four cities exhibited black strikebreaking while Cleveland did not. Contradictions indicate an inadequately specified model (Ragin, 1987) because identical conditions should lead to similar outcomes. To resolve contradictions, comparative researchers reexamine both their theory and their cases. It may be that an error was made in the process of casing and that the contradictory case(s) does not properly belong to the population under investigation. More commonly, the researcher uncovers an additional causal condition that explains the contradictory result. In the analysis at hand, Brown and Boswell (1995) considered three variables that they

Table 1.1   Causal conditions and presence of Black strikebreaking (from Brown and Boswell, 1995, Table 5)

City	Recent Black migration	Weak union	Political repression	Black strikebreaking
Bethlehem	No	Yes	Yes	No
Buffalo	Yes	No	Yes	Yes
Chicago	Yes	No	Yes	Yes
Cleveland	Yes	No	No	No
Decatur	No	No	Yes	No
East Chicago	Yes	Yes	Yes	Yes
Gary	Yes	No	Yes	Yes
Johnstown	Yes	No	Yes	Yes
Joliet	No	Yes	Yes	No
McKeesport	No	Yes	Yes	No
Milwaukee	No	Yes	Yes	No
New Castle	No	Yes	Yes	No
Pittsburgh	Yes	Yes	Yes	Yes
Reading	No	Yes	Yes	No
Wheeling	No	No	No	No
Youngstown	Yes	Yes	Yes	Yes

suspected might affect the connection between black migration and strong unions, on the one hand, and black strikebreaking, on the other: city size, whether the city was dominated by US Steel or Bethlehem Steel, and local government repression. The addition of the third condition, local government repression, yielded a truth table free of contradictions and also was confirmed as causally relevant in their case studies.

A truth table consists of one row per logically possible combination of conditions. A truth table, then, has 2^k rows, where k equals the number of causal conditions. As the number of causal conditions increases, and the size of the truth table grows exponentially, analysis become increasingly complex. Software packages such as fsQCA (Ragin et al., 2006a) can help to manage this complexity; nevertheless, most practitioners examine between five and ten causal conditions. To construct the truth table, the researcher refers to the previously specified dataset and records which combinations of causal conditions are associated with the presence of the outcome and which are associated with its absence.[5] Brown and Boswell's (1995) final truth table is presented in Table 1.2.

Brown and Boswell (1995) find that all but one of the possible combinations is represented by at least one city; of those, two combinations are associated with the emergence of black strikebreaking. The causal combination that is not represented in the sample is referred to as a 'remainder' (Ragin et al., 2006b) and is identified by marking the outcome with a dash (–). Remainders are common because social phenomena are

Table 1.2   Truth table for the presence of Black strikebreaking, derived from Brown and Boswell (1995: 1505, Table 5)

	M	U	R	Y	Cases
1	1	1	1	1	East Chicago, Pittsburgh, Youngstown
2	1	1	0	–	
3	1	0	1	1	Buffalo, Chicago, Gary, Johnstown
4	1	0	0	0	Cleveland
5	0	1	1	0	Bethlehem, Joliet, McKeesport, New Castle, Reading
6	0	1	0	0	Milwaukee
7	0	0	1	0	Decatur
8	0	0	0	0	Wheeling

Note: M = recent black migration, U = weak union, R = political repression, Y = black strikebreaking

characterized by limited diversity (Ragin, 1987: 104–13; 2000). That is, many of the logically possible combinations of causal conditions simply do not exist in reality. (We address the issue of limited diversity, especially its relation to counterfactual analysis, in greater detail below).

Mill's methods of agreement and difference

The classic techniques of comparative methodology are those proposed by Mill (1875). The simplest of all comparative logics, the method of agreement is also the most likely to lead to faulty conclusions. The logic behind the method of agreement holds that any given outcome will, inevitably, have a single cause. By examining a sample of cases exhibiting the same outcome, a researcher seeks to identify the single cause that all cases have in common. Ragin (1987: 36) extends this logic to encompass combinations of conditions, arguing that the successful identification of a shared combination of causally relevant conditions would also satisfy the method of agreement. Applying the method of agreement to Brown and Boswell's (1995) truth table (Table 1.2), reveals that all instances of black strikebreaking occurred in cities characterized by recent black migration and political repression. According to Mill's method of agreement, then, the research will conclude that the combined presence of recent black migration and political repression caused black strikebreaking. The process by which the cause produces the outcome remains to be explained. In the absence of a well-specified theory, such explanations are generally best developed through the application of within-case methods such as process tracing.

Mill's indirect method of difference – what Ragin (1987: 39) refers to as 'a double application of the method of agreement' – leverages negative cases (that is, cases that do not exhibit the outcome) in order to strengthen the researcher's conclusions.

The researcher first applies the method of agreement to the positive cases exhibiting the outcome. Upon identifying a causal condition (or causal combination) associated with the outcome, the researcher examines the negative cases to see if the absence of the outcome is associated with the absence of the cause. Referring again to Brown and Boswell's (1995) truth table (Table 1.2), the method of difference reconfirms the initial conclusion that black strikebreaking is a product of recent black migration and political repression. Of the five configurations that exhibit the absence of strikebreaking, none exhibits the presence of both recent black migration and political repression.

As the indirect method of difference comprises two applications of the method of agreement, the same two limitations apply to both methods. The first – the threat of an omitted variable – is common to all comparative research methods and, indeed, all social research methods. Researchers may draw the wrong conclusion when important causes are omitted. If the identified causal condition is, itself, caused by an antecedent condition, the researcher's explanation will be incomplete. Spurious relationships raise a similar type of issue. If both the identified causal condition and the outcome are caused by an omitted third condition, the researcher may identify the wrong condition as causing the outcome. In this latter situation, one hopes that the error will be uncovered as the researcher examines his or her cases and when attempting to elucidate how the condition causes the outcome. The second and more significant limitation of the method of agreement is that it is incapable of addressing multiple conjunctural causation. As Mill (1875), himself, emphasized, when an outcome has more than one cause, the method of agreement will not be able to identify any of them:

> That some one antecedent is the cause of a given effect because all other antecedents have been found capable of being eliminated, is a just inference only if the effect can have but one cause. If it admits of several, nothing is more natural than that each of these should separately admit of being eliminated. (1875: 474–5)

Qualitative Comparative Analysis

Qualitative Comparative Analysis (QCA, see Ragin, 1987; 2000) builds upon Mill's methods in two fundamental ways. Most significantly, QCA permits the analysis of multiple conjunctural causation, addressing the greatest limitation of Mill's methods. Moreover, by employing counterfactual analysis, QCA permits a more nuanced analysis of the relationship between causal conditions and the presence and absence of outcomes.

Rooted in set theory, QCA uses set algebra – also known as Boolean algebra – to analyze causal configurations. Boolean algebra provides operations for analyzing and manipulating sets. The most useful of these operations for comparative research are discussed in Ragin (2000: 171–180) and include set *union* (logical *or*, represented as addition) and set *intersection* (logical *and*, represented as multiplication). Truth table configurations are represented as Boolean equations in which an uppercase letter represents the presence of a condition while a lowercase letter represents its absence. In Boolean notation, Row 1 of Table 1.2 is represented as:

$$\text{M·U·R} \xrightarrow{\text{ s }} \text{Y}$$

which indicates that 'The presence of black migration in combination with a weak union and political repression is sufficient for black strikebreaking.' Just as with linear algebra, a shortened notation may be used for multiplicative terms, and the above equation also may be represented as:

$$\text{MuR} \xrightarrow{\text{ s }} \text{Y}$$

Row 5, which is read as 'The absence of recent black migration in combination with a weak union and political repression is sufficient for the absence of black strikebreaking,' is represented as:

$$\text{mUR} \xrightarrow{\text{ s }} \text{y}$$

Truth table reduction

The analysis of multiple conjunctural causation involves a process known as 'truth table reduction' or 'Boolean minimization.' A reduced or simplified truth table results in a Boolean equation that expresses the various causal combinations that are associated with the presence of the outcome. Ragin (1987) details the complete minimization process; here, we provide only an overview.[6] The basic process of Boolean minimization is derived from the proposition that invariant, or close to invariant, connections exist between explanatory conditions and outcomes. Each row of the truth table represents a logically possible combination of causal conditions. For each combination that is associated with the presence of the outcome, the truth table reduction process seeks to eliminate logically redundant terms. In Table 1.2, the first and third configurations are represented by the equations:

$$\text{MUR} \xrightarrow{\text{ s }} \text{Y}$$

$$\text{MuR} \xrightarrow{\text{ s }} \text{Y}$$

When a pair of equations is identical except for a *single* causal condition, the distinguishing term may be considered irrelevant and can be eliminated. The minimization of these two equations, therefore, produces:

$$\text{MR} \xrightarrow{\text{ s }} \text{Y}$$

which is the same result as was obtained through the application of Mill's method of agreement: the presence of recent black migration and political repression resulted in black strikebreaking. QCA's methods are a superset of Mill's methods.

A more complex example is provided by Stokke's (2007) analysis of 'shaming' as an attempt to secure compliance with international fishing agreements. Shaming involves an attempt to change a party's behavior by exposing their violations to others (in this case, the international community). Having

conducted a series of case studies of shaming attempts, Stokke (2007) identifies five causal conditions that affect whether shaming attempts are successful.

1. Advice (A): Whether the shamers can substantiate their criticism by reference to explicit advice by the regime's scientific body.
2. Commitment (C): Whether the target behavior violates explicit commitments.
3. Shadow of the future (S): The target's perceived need to strike future deals and whether ignoring the criticism will jeopardize such beneficial arrangements.

4. Inconvenience (I): The inconvenience [to the target] of the behavioral change that the shamers seek to elicit.
5. Reverberation (R): Domestic-level political costs if shamers scandalize [the target] as a culprit. (p. 503)

Having conducted his case studies and identified his causal conditions, Stokke (2007) produces a truth table which we have reproduced as Table 1.3.[7] With five causal conditions, the corresponding truth table has 32 logically possible combinations. The ten cases are distributed among eight configurations, resulting in 24 remainders (two

Table 1.3 Truth table for the presence of shaming, with counterfactual conditions (based on Stokke, 2007, Table 1)

	A	C	S	I	R	Y	Cases
1	1	1	1	1	1	1	Compliance
2	1	1	1	1	0	0	EC unilat. 1
3	1	1	1	0	1	–	
4	1	1	1	0	0	1	EC unilat. 2
5	1	1	0	1	1	–	
6	1	1	0	1	0	–	
7	1	1	0	0	1	–	
8	1	1	0	0	0	–	
9	1	0	1	1	1	1	Overfishing
10	1	0	1	1	0	–	
11	1	0	1	0	1	–	
12	1	0	1	0	0	–	
13	1	0	0	1	1	0	Mesh-size 2
14	1	0	0	1	0	0	Mesh-size 1
15	1	0	0	0	1	–	
16	1	0	0	0	0	1	Krill report, Krill cap2
17	0	1	1	1	1	–	
18	0	1	1	1	0	–	
19	0	1	1	0	1	–	
20	0	1	1	0	0	–	
21	0	1	0	1	1	–	
22	0	1	0	1	0	–	
23	0	1	0	0	1	–	
24	0	1	0	0	0	–	
25	0	0	1	1	1	–	
26	0	0	1	1	0	–	
27	0	0	1	0	1	–	
28	0	0	1	0	0	–	
29	0	0	0	1	1	–	
30	0	0	0	1	0	0	Loophole, Krill cap 1
31	0	0	0	0	1	–	
32	0	0	0	0	0	–	

Note: A = Advice, C = Commitment, S = Shadow of the Future, I = Inconvenience, R = Reverberation

configurations, Acsir and acsIr, characterize two cases each).

Half of the represented configurations are examples of successful shaming:

$$ACSIR \xrightarrow{\quad s \quad} Y$$

$$ACSir \xrightarrow{\quad s \quad} Y$$

$$AcSIR \xrightarrow{\quad s \quad} Y$$

$$Acsir \xrightarrow{\quad s \quad} Y$$

As the first and third equations differ only with regard to the presence of commitment, that causal condition may be eliminated from those configurations. The resulting minimized Boolean equation:

$$ASIR + ACSir + Acsir \xrightarrow{\quad s \quad} Y$$

states that there are three combinations of conditions that result in successful attempts at shaming. Observe that this solution is far more complex and nuanced than that produced by Mill's method of agreement. The method of agreement would identify only condition A (the presence of explicit advice from the scientific community) as common to all events of successful shaming. The method of agreement, therefore, produces:

$$A \xrightarrow{\quad s \quad} Y$$

This equation is too simplistic a solution to be convincing: surely the process of successfully shaming a regime is more complicated than simply having the support of the scientific community. And, indeed, application of Mill's indirect method of difference confirms this assertion. An examination of Table 1.3 rejects the hypothesis that it is exclusively the scientific community that determines whether attempts at shaming will be successful. Configurations 2, 13, and 14 are all instances of unsuccessful shaming over the objections of the scientific community. In this instance, Mill's methods are incapable

of determining the cause of successful shaming.

Complexity, parsimony, and counterfactual analysis

In developing explanations of social life, in 'telling about society' (Becker, 1986), social researchers seek to balance complexity and parsimony. The avoidance of crude, vulgar accounts demands that researchers recognize the possibility of multiple conjunctural causation, that there may exist a variety of explanations, across cases, for the same outcome. Indeed, Mill (1875) observes that, in the social world, multiple conjunctural causation is not the exception but the rule:

> Now, in the case of political phenomena, the supposition of unity of cause is not only wide of the truth, but at an immeasurable distance from it. The causes of every social phenomenon which we are particularly interested about, security, wealth, freedom, good government, public virtue, general intelligence, or their opposites, are infinitely numerous, especially the external or remote causes, which alone are, for the most part, accessible to direct observation. No one cause suffices of itself to produce any of these phenomena. (1875: 475)

And yet an explanation that is too particular, too qualified, can be as unsatisfying as one that is too general.

> This tension between particularization and generalization – between literal and abstract representation – comes with the territory, I think, when you're transmitting vicarious experience. A simple chronicle of details, however graphic, locks you into a particular time and place. You move beyond it by abstracting, but abstracting is an artificial exercise, involving an oversimplification of complex realities (Gaddis, 2002: 14).

This tension is particularly acute in comparative research which studies both similarity and difference (Ragin, 1994). To establish set membership and identify explicit relations among sets, comparative researchers must maintain the integrity and distinctiveness of their cases while demonstrating what they do and do not have in common. The more that a researcher emphasizes the particular circumstances and experiences of a case, the more that a researcher restricts their scope and

possibility conditions, the less portable the argument becomes.

Counterfactual analysis provides a means by which comparativists can balance particularity and generality. Exploring how the hypothetical presence or absence of a causal condition would affect the outcome under investigation, counterfactual analysis is predominantly associated with case-oriented research. In fact, all social research involves counterfactual analysis in some way (Lieberson, 1985) but case-oriented researchers tend to make their counterfactual theorizing explicit (Fearon, 1991). In comparative research, counterfactual cases form the basis of thought experiments through which researchers assess a theory's plausibility (Weber, 1905).

Counterfactual analysis is particularly useful as a theory development tool (McKeown, 2004). Recognizing the complexity of the social world, researchers tend to be conservative when constructing theories. Preferring to claim too little rather than too much, social researchers are more likely to make errors of omission rather than commission. Counterfactual analysis provides a means by which to test the implications of a theory (McKeown, 2004) and thereby assess the viability of more parsimonious variants. For any given analysis a researcher may construct a variety of counterfactual cases. Frequently, just a single causal condition is altered; more complex analyses examine a range of hypothetical conditions.

Truth tables permit a systematic approach to counterfactual analysis, one which encompasses both simple and complex counterfactuals. As previously discussed, the social world is characterized by limited diversity. In truth tables, limited diversity manifests itself as 'remainders' – the logically possible configurations of causal conditions that lack empirical instances. Representing 'events that did not happen' (Lieberson, 1985: 45), remainders serve as counterfactual cases in comparative research (Ragin and Sonnett, 2004).

Counterfactual analysis using remainders is straightforward: the researcher asks 'How would my conclusions change if the counterfactual existed?' Instead of running a thought experiment, however, the comparative researcher need only include the remainder in the analysis. Whether to incorporate a particular counterfactual case is a determination that must be made upon the basis of substantive and theoretical knowledge (Ragin and Sonnett, 2004). Two criteria must be evaluated. Is the counterfactual case plausible? And, if so, is it reasonable to think that it would produce the outcome in question? Depending upon how it affects the set relations within the truth table, the inclusion of remainders may result in a Boolean equation that is more parsimonious, more complex, or the equivalent of the original solution. Researchers must use their substantive and theoretical knowledge to evaluate the feasibility of any solution resulting from the inclusion of counterfactuals.

Software packages such as fsQCA (Ragin et al., 2006a) simplify the process of conducting counterfactual analysis. For example, by incorporating all remainders that produce a simpler result, fsQCA can be used to identify the most parsimonious solution possible for any truth table. Applying this procedure to Stokke's truth table (Table 1.3) produces a dramatically simpler solution:

$$i + SR \xrightarrow{\;s\;} Y$$

which indicates that shaming will be successful when (a) it is not inconvenient for the targets of the shaming to change their behavior or (b) when future considerations and present political costs are high.

This solution and the previous solution of the same truth table can be considered two endpoints on a continuum that runs from complexity to parsimony. Observe that the complex solution (Acsir + ACSir + ASIR) is a subset of the parsimonious solution (i + SR). Cases of shaming that involve the absence of inconvenience to the target – that is, members of set i include members of sets Acsir and ACSir. Likewise, cases of shaming that invoke a shadow of the future and reverberations – members of set SR – include members of set ASIR. The presence of this

subset relationship indicates that it is possible to select counterfactual cases to produce intermediate solutions, between the parsimonious and the complex.

One way to derive an intermediate solution is to use the technique described in Ragin and Sonnett (2004). Examining the term ASIR, Ragin and Sonnett (2004) observe that 'Causal conditions S and R cannot be removed because they appear in the corresponding parsimonious term (SR) at the other end of the continuum' (p.16). To remove S or R would violate the subset relationship and, therefore, the only candidates for removal are A and I. To discern whether either of these conditions may be removed, the researcher must rely upon theoretical and substantive knowledge. The fact that the support of the regime's scientific advisory board is the only condition present in all cases of successful shaming suggests that it may be a necessary condition and should be retained. However, it does not make sense that shaming would be more likely to be successful when it is inconvenient (I) for a target to change its behavior than when it is convenient (i). The causal condition I, therefore, may be dropped to produce the causal combination ASR.

The same logic applies to the sets Acsir and ACSir. Conditions i, S, and R cannot be removed because it would violate the subset relationship. Nor should conditions A, C, and S be removed as each should contribute to the success of shaming. Removing conditions c, s, and r produces the terms Ai and ACSi. As the latter causal combination is a subset of the former, it may be removed, leaving Ai. The reduced terms, ASR and Ai, yield the intermediate Boolean equation:

$$Ai + ASR \xrightarrow{\text{S}} Y$$

which is a superset of the complex solution (Acsir + ACSir + ASIR) and a subset of the parsimonious solution (i + SR).

As long as the subset principle – that more complex solutions must be a subset of more parsimonious solutions – is maintained, researchers can produce a series of such intermediate solutions using counterfactual analysis.[8] The researcher can then adjudicate among the various solutions, selecting that one that best balances specificity and generalizability given the current state of theory and what is known about the cases.

CONCLUSION

Comparative research is frequently seen as a bridge connecting the worlds of qualitative, case-oriented research and quantitative, variable-oriented research. Focusing on a moderate number of cases, comparativists are able to engage in both theory development (usually the province of qualitative researchers) and hypothesis testing (usually the province of quantitative researchers). While comparative research can certainly be seen as a bridge, its greatest strengths arise from its distinctiveness. In common with the bulk of social science theorizing, comparative methods are fundamentally set theoretic.

In contrast to conventional variable-oriented researchers, comparativists do not seek mere associations but, rather, seek to establish explicit connections among social phenomena, conceived in set-theoretic terms. To do this, comparativists maintain the integrity of cases so as to identify sets that share members. Set relationships take three basic forms. A *descriptive set relation* articulates connections among sets but stops short of explanation. A *constitutive set relation* identifies essential aspects or components of wholes and may be used to constitute theoretically based populations (e.g., the set of modernizing revolutions). A *causal set relation* goes beyond establishing an empirical connection and details the causal mechanisms that explain how and why membership in one set (the cause) is empirically linked to membership in another (the outcome). Causal set relations often address conditions of necessity and/or sufficiency, with a special concern for causal heterogeneity and INUS causation (Mackie, 1974).

The core of causal analysis in comparative research is the truth table, just as the core of variable-oriented causal research is the linear additive regression equation. These are fundamentally different ways of understanding the social world. The configurational perspective of comparative research emphasizes the search for highly consistent relationships linking combinations of causes to outcomes. The truth table models these relationships. Considering that comparativists typically trace their lineage to the likes of Durkheim and Weber, the introduction of truth table analysis to comparative research is relatively recent (Ragin, 1987). We have argued, however, that most comparative analysis involves truth tables, either explicitly or implicitly. Contemporary methodological developments – specifically, the formalization of the comparative method as Qualitative Comparative Analysis (QCA) – aim to improve comparative research by making explicit its assumptions, algorithms, and techniques. This formalization has allowed the development of software packages to facilitate technical aspects of comparative analysis, which in turn frees researchers to concentrate on their most important task: getting to know their cases (Rubinson and Ragin, 2007).

If there is a downside to this formalization and the associated development of software packages for comparative analysis, it is the fear – as others have speculated (Shalev, 2007) – that lowering the bar to entry will encourage the rote application of comparative methods. In fact, we expect the opposite. Truth table analysis simultaneously eliminates the most banal analytic tasks while permitting a more sophisticated analysis of more cases in more depth. The investigation of necessary and sufficient conditions, causal complexity, and counterfactuals all become increasingly feasible through the application of QCA, which directly implements the set theoretic logic of comparative analysis. Comparative research can, indeed, be done with or without formal techniques; however, it is best done with an appreciation of its distinctiveness.

NOTES

1. We recognize that Weber also postulated more complex models of capitalism. See, for example, Collins (1980), Giddens (1958), and Weber (1920). Here, we restrict our discussion to Weber's model as presented in *The Protestant Ethic* for illustrative purposes.

2. The cities that Brown and Boswell (1995) include in the analysis are: Bethlehem, Buffalo, Chicago, Cleveland, Decatur, East Chicago, Gary, Johnstown, Joliet, McKeesport, Milwaukee, New Castle, Pittsburg, Reading, Wheeling, and Youngstown.

3. The four outcomes that Brown and Boswell (1995) examine are: (1) black strikebreaking (whites support union), (2) white strikebreaking (blacks support union), (3) biracial strikebreaking (low overall compliance with union), and (4) biracial labor coalition (high overall compliance with union).

4. Brown and Boswell (1995) do not actually present this dataset in their article. Rather, it is derived from the truth table that they present as Table 5 on page 1505. We are able to derive the original dataset from the truth table only because the researchers include a column listing which cities correspond to which causal configurations. This is one reason that we strongly recommend that comparative researchers explicitly identify which cases correspond to which truth table configurations. (The primary reason being so that cases remain in the foreground of the analysis.)

5. Based upon substantive and theoretical knowledge, the researcher may specify a threshold indicating the outcome's presence. For example, in a large dataset the researcher may specify that the outcome must be present in at least three (or five or ten) cases to be recognized whereas in a small dataset the researcher may specify a minimum threshold of one case. Threshold specification relies upon the researcher's in-depth knowledge of the population. For the present discussion, we rely upon Brown and Boswell (1995) threshold of one case, which is reasonable for an N of 16 cases. For additional discussion of threshold specifications, see Ragin (2005) and von Eye (1990).

6. Specifically, we omit a discussion of prime implicant minimization (see Ragin, 1987: 95–98). Prime implicant minimization does not apply to the examples we review and does not affect our results.

7. There is an inconsistency in Stokke's (2007: 507) reported truth table: rows 4 and 8 share the same configuration of causal conditions and outcomes. Our Table 1.3 reflects this correction.

8. The software package fsQCA (Ragin et al., 2006a) includes procedures to facilitate such analyses.

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