

INTRODUCTION TO THE COMPARATIVE METHOD WITH BOOLEAN ALGEBRA

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*“Il n’y a rien que l’esprit humain fasse si
souvent que des comparaisons.”*

—*Encyclopédie*, Volume Three (1753).

CHAPTER 1. DEFINITION

Comparison is a fundamental principle of science as well as a basic element of everyday life. It is a spontaneous mental process, so that “[t]hinking without comparison is unthinkable” (Swanson, 1971, p. 145). Daily we compare lines in shops (shorter or longer), the weather from one day to the next (better or worse), the size of clothing articles (larger or smaller), the arrival of trains (earlier or later). Simple terms like “densely populated” make implicit comparisons (Smelser, 1976, p. 3). In the social sciences, researchers compare the quality of life between cities, the stability of governments across countries, economic behavior between social groups, and the impact of rituals on social cohesion. With classification (Bailey, 1994, in this same series), comparison is one of the crucial conceptual processes making the world intelligible.

Objects, Attributes, Values

In its simplest form, comparison can be defined as the juxtaposition of *values* (units of variation) of *attributes* (properties) shared by two or more *objects* or cases (units of observation). For example, according to the World Bank, the 2002 annual gross domestic product (GDP) growth (attribute) was 2.4% and 8.0% (values) in the United States and China (objects). Or the timing of democratization (attribute) has been precocious (value)

in Britain (object) and delayed in Russia. The same applies if we compare objects over time. Electoral volatility in Italy was 23.0 and 8.3 in 1948 and 1983, respectively. Here, the objects of the comparison are elections. That is to say that comparison is about variation: *variation in the score or value of a variable across a number of cases*.

In the first place, to compare means to describe variables. Together with explanation and prediction, description is one of the main tasks of scientific enterprise. Descriptive comparisons focus on the *degree of similarity and difference* between two or more cases. Descriptive comparisons can be (1) *nominal*—presence/absence or different types of attributes (e.g., the electoral system in Switzerland is proportional representation whereas in Britain it is plurality); (2) *ordinal*—more/less; or earlier/later and faster/slower in temporal comparisons (e.g., state formation occurred earlier in Britain than in Switzerland); or (3) *quantitative* (interval and ratio) when the values are continuous and quantifiable (e.g., the number of effective parties in Switzerland is 2.92 higher than in Britain).

Comparison as a Method

The intrinsic character of descriptive comparisons in all human activities leads to a first question. If comparison is a ubiquitous mental process, from daily life to scientific research, why do we speak of a comparative “method”? The answer is that the comparative *method* is something else—and more—than simply a natural mental activity. It is a method to analyze *relationships* between phenomena and their *causal connections*, that is, to test against empirical evidence alternative hypotheses on cause–effect relationships in the form of “if . . . , then . . .” statements. In addition to being an indispensable cognitive and descriptive tool, the comparative method is explanatory, a *method to control variation* (Smelser, 1976, p. 152) and to establish generalizations or “laws” between variables (Lijphart, 1971, p. 683; Sartori, 1970, p. 1035)—ultimately a *method of inductive inference*.

To compare, therefore, does not only mean to describe variation. Variation is necessary for *explanation*. Without variation (different scores or values of variables across cases), explanation is not possible. This is true for all types of comparisons, whether they are large-scale comparative studies based on a large number of cases analyzed through statistical (quantitative) techniques or small-scale comparative studies based on few cases analyzed through logical and Boolean algebra. Even though the label “comparative method” is today increasingly equated with this second approach, the fundamental principles are the same. In fact, most practitioners of the comparative method would agree that there are basic commonalities between “quantitative” and “qualitative” techniques.¹

Accordingly, the comparative method can be defined as *a set of logically based procedures for systematically testing against empirical evidence alternative (or competing) hypotheses about causal connections between phenomena, and thereby either corroborate or reject them*. The comparative method aims at identifying lawlike “causal regularities” (Skocpol, 1984a, pp. 374–386). This analytical approach is not the only way of conducting comparative research (Peters, 1998, pp. 9–11). Comparativists also use other approaches, which, however, cannot be considered control methods—such as causal interpretations—because they do not test against empirical evidence hypotheses about causal connections (Skocpol, 1984a, p. 372).

Comparison and Other Methods

It is important to note that such a definition of the comparative method encompasses a number of other methods too. It does apply equally to experimental and statistical methods. It is not confined to what in recent years has come to be identified with a narrow definition of the comparative method—namely, comparison based on Mill’s methods and Boolean algebra.

This leads to a second question. If the comparative method shares its analytical character with other methods—and the term “comparison” has indeed been applied to experimental and statistical methods by Durkheim and Parsons—*is there a difference between the comparative method and other methods?* What is specific about the comparative method?

Some authors maintain that without comparison all scientific thought is unimaginable (Swanson, 1971, p. 145) and that research, in one form or other, is unavoidably comparative (Lasswell, 1968, p. 3; Lieberman, 1985, p. 44). Almond notes (1966), “[i]t makes no sense to speak of a comparative method in political science since if it is a science, it goes without saying that it is comparative” (pp. 877–878). Because comparison constitutes the core of all scientific explanation (Armer, 1973; Bailey, 1982; Blalock, 1961; Nagel, 1961), some authors object to the logical and epistemological distinctiveness of the comparative method (Grimshaw, 1973, p. 18). As Klingman (1980, p. 124) notes, many of the debates forget that all science is inherently comparative. The fundamental epistemological principles of control and verification of causal relationships are common to all methods used in the empirical social sciences.

This argument maintains that there is a fundamental continuity between methods. While experiments are distinct because it is possible to manipulate variables,² between statistical and comparative methods “there is no such unambiguous dividing line” (Lijphart, 1975, 159–160). Smelser (1976) sees in the comparative method an approximation of statistics. Frenreis (1983) argues that all methods are based on covariation. “Comparative studies”—that is, cross-country analyses—are often based on statistics, so that a

comparative *perspective* or *strategy* does not presuppose a distinctive comparative *method* (Benjamin, 1977; Lijphart, 1975; Pennings, Keman, & Kleinnijenhuis, 2007). Comparative studies often rely on statistical research designs, with many cases and quantitative variables. In this broad definition, the comparative method is nothing other than the statistical method applied to designs involving cross-country analyses.

Indeed, for some the specificity of the comparative method lies uniquely in its *goals*: “comparativists are interested in identifying the similarities and differences among macrosocial units” (Ragin, 1987, p. 6). The distinctive aspect is the analysis of countries, societies, civilizations. In the past “comparative politics” (particularly in the United States) used to designate studies on “other” countries. Even today, comparison is often synonymous with either (1) cross-country studies or (2) studies in which the macrosocietal level is used as a control variable in individual-level designs (Przeworski & Teune, 1970). Comparison has for long simply meant the presence of attributes at the level of societies in explanatory statements. This specific goal sets a broad sense of the comparative method, simply as cross-societal analysis through a variety of methods (Easthope, 1974).

An alternative to this “practical” definition points to the *methodological consequences* of research questions with macrosocietal units as cases. It is argued that the comparative method is best suited to answer research questions in which a *low number of cases* are involved (the “small-N problem”). Besides being more “methodological,” this alternative has also the advantage of not confining the scope of the comparative method to cross-societal designs. The comparative method can be employed to analyze various types of units: territorial units more generally, but also organizations (such as trade unions, parties, social movements) and individuals. Yet this definition, too, misses to establish a clear dividing line (other than the “N”) with other methods.

Does a *distinct* comparative method exist at all? If methods share all major principles and resemble one another “in all respects except one [the N]” (Lijphart, 1971, p. 684), why speak of a comparative method? In recent years, three distinctive aspects have been stressed:

- First, its reliance on *Mill’s first three canons* (Method of Agreement, Method of Difference, and the Joint Method) and Boolean algebra dealing with “qualities” rather than degrees (“quantities”). (Incidentally, this should clarify the frequent terminological overlap between “comparative” and “qualitative.”)
- Second, an acceptance of causation based on *necessary and sufficient conditions*.
- Third, the *combinatorial or configurational* nature of explanatory models.

Comparison and Statistics

On the basis of these distinctive aspects a “comparative method” has progressively separated from statistics. Through this separation, the comparative method becomes not simply statistics applied to cross-country analyses but a different method from statistics. In recent years this alternative method has been labeled—and identified with—“*the comparative method*.” Obviously, comparative research is still carried out with statistics in broad large-scale designs (what we have called here a *comparative strategy* or *perspective*). Yet a distinct method was developed using other techniques (Mill’s first three methods and Boolean algebra), a different understanding of causality (based on necessary and sufficient conditions), and a stress on combinatorial or configurational relationship between independent variables (as opposed to a purely additive type of relationship).

It appears, however, that the commonalities with statistics are stronger than the proponents of this new “comparative method” assume. First, statistical techniques are well able to deal with “qualitative,” categorical, discrete, dummy, and dichotomous data (not only in contingency tables but also, and most importantly, through *log-linear analysis*, *logistic regression*, and *probit models* that are treated in more depth in other books of the QASS series; see Aldrich & Nelson, 1984; DeMaris, 1992; Hardy, 1993; Ishii-Kuntz, 1994; Kant Borooah, 2001; Knoke & Burke, 1980; Liao, 1994; Menard, 2001; Pampel, 2000). Second, many statistical techniques are well equipped to deal with combinatorial and configurational explanatory designs (through *interaction effects*, most notably in contingency tables but also in regression analyses; see in particular Jaccard & Wan, 1996; Jaccard & Turrisi, 2003 in this series).

That is to say that between the often juxtaposed “quantitative” and “qualitative” techniques there is *little difference in the fundamental principles*. The focus of this book is on what in the recent years has come to be equated with “the” comparative method. This focus will highlight the strengths and the specificities of the narrow definition of the comparative method—namely, *its capacity to deal with few cases and differentiate between necessary and sufficient conditions*. The book concentrates on what is specific to this kind of comparison as opposed to the broader definition that includes also large-scale comparative strategies between countries based on statistical designs. Yet throughout the book, references to the large-scale statistical techniques will be made (1) to stress the commonalities between comparative and statistical methods and (2) to highlight which aspects of statistics are most relevant for cross-national comparison. First, however, a brief overview of the origins of comparative inquiry is in order.