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## GENERAL INTRODUCTION

To give the subject of this volume—*multilevel analysis*—its proper place within the general context of the social sciences, it is useful to start with an overview of the issues and questions raised by these disciplines. Compared with the natural sciences, the social sciences are far from fully constituted, and it is important to realise how their relevance can be improved by taking multiple aggregation levels into account.

First, the social sciences begin with the observation of a human behaviour or phenomenon, and then seek to structure it into different fields, which will constitute the specific object of each science. As a rule, the objects are defined independently of the vantage-point and scale that we can adopt to observe them. For example, the object of economics is the production, distribution, and consumption of wealth, but there is no indication of whether the level chosen is the individual, a market, a firm, or a nation. Likewise, the object of demography is the quantitative study of human populations, their variations, and their condition, but demographers do not specify whether the study is at the level of a family, a local population, or a national population. In other words, the distinction between levels precedes the object of each of these sciences, and we shall see that they are all subjected to it.

Second, the social sciences need to discover the categories that will provide suitable starting points for their development. It may be tempting for any individual, who routinely experiences these various social facts, to remain content with their apparent meaning and with a naive explanation of the lived experience in its immediacy—either because the individual already realises its meaning, or because he or she feels its absence and is preparing to search for it among similar lived experiences (Granger, 1994). This is true of the many phenomena studied in the social sciences, such as the birth of a child in demography, a price rise in economics, the fact that a person develops AIDS in epidemiology, or the fact that a person solves a problem in psychology. Far from being convinced of the complexity and opaqueness of these phenomena, naive observers see them as being fraught with explanation, because of their possible experience of similar circumstances and because of their personal knowledge of the conditions and consequences of their everyday actions. But this explanation, specific to each individual, will differ from that of other individuals with other experiences. As a result, it will not provide any schematisation that can be adopted by all and be publicly intelligible. The social sciences must therefore set aside such explanations and identify conceptual categories that will allow them to objectivate human experience, even provisionally. Although these nascent sciences, by comparison with the “non-social” sciences, have not yet identified the categories with sufficient clarity,

we can assume that the objectivation process is under way. We shall return to this point in the volume's conclusion.

Third, we need to realise that all scientific knowledge assumes a splitting of reality into a concrete aspect and a virtual aspect—the latter being a fairly abstract image of the events explored by the scientist. For the social sciences, the observation of individuals, groups or societies provides the “reality” that they will study. But unlike in the physical sciences, where there is only one type of virtuality—an abstract construct based on the formal properties of physical phenomena—virtuality in the social sciences undergoes a split as well. The first virtuality obtained is “an abstract construct, external by nature to the conscience of human actors albeit very *real*; it provides a scaffolding for the knowledge of facts” (Granger, 2001, p. 191): by placing this virtuality in the foreground, the social sciences attempt to *explain* human behaviours, developing the structure that will enable social scientists to describe the phenomena observed. The second virtuality resulting from the split is experienced by the actors: it is a complex of thoughts, affects, and intentions that make it possible to *understand* the behaviour of a given individual, without being entirely accessible to the social scientist. We are dealing here with a “clinical knowledge” that aims to grasp human facts in their singularity, in their individuality and not in their generality. However, it is this experienced virtuality that will confer meaning upon the abstract construct that the social scientist is trying to achieve. As we shall see, it is from life stories told by individuals themselves that biographical analysis will be able to take shape: the stories will provide the raw material from which we can construct a process underlying all these biographies.

We will not elaborate here on this “clinical knowledge” of singular human facts, which psychoanalysis and some currents of psychology and sociology are seeking to attain. The process of capturing the individual, in this case,

consists in constructing and superimposing ever more detailed networks of conceptual representation, each of which represents only a generic virtuality. It is the assumed convergence of the superposition of these grids that would bring us closer to an understanding of the individual. But it would, at best, impart only a limit meaning to this scientific reality of the individual. When measured against its concrete aspect, the limit meaning remains indefinitely incomplete (Granger, 2001, p. 206).

We shall therefore give priority to a virtual theoretical representation—divorced from the procedures of an individualised and unique capture of phenomena—and a scientific description of human reality, using concepts chained together in causal relationships, which will lead to models. Among the sciences examined in closer detail in this volume are demography, economics, epidemiology, education, human geography and social statistics. These are in fact the main social sciences for which multilevel modelling proves to be the most relevant.

It is only when social scientists attempt to observe behaviours and objectivate the environment where they occur and the manner in which they operate that they will face the problem of aggregation—in a space that is both physical and social—and the problem of choosing a suitable time scale. There will be many questions as to the choice of the right aggregation level: Should

the observation focus on aggregate or individual behaviours? Will the methods used to identify the relationships between the values measured be the same or totally different depending on the level of observation? Can several aggregation levels be used simultaneously? and so on. The social scientist will also need to address the issue of time: Will it be historical time, in which the events studied unfold, or, on the contrary, the time lived by the individual who experiences the events? Will the observation point be a precise moment of that “lived” time, in order to explain the behaviours occurring then by conditions prevailing immediately beforehand? Or, on the contrary, will the observation span an individual’s entire life, involving constantly changing conditions? These issues have been present from the very beginning of social-science research. We shall address them throughout this volume, and try to find satisfactory solutions.

The multilevel approach—which has recently gained ground—tackles the issues from a fresh angle. Within the framework of a single model, it seeks to achieve a synthesis connecting individuals to the society in which they live. For this purpose, it uses intermediate levels, which can vary from one science to another: for example, class and school, in education; the village, the town, and the region, in human geography; the family, the household, and the contact circle, in demography. This approach recognises that the grouping of individuals according to these various levels introduces an influence of the group on its members and, conversely, an influence of members on the group’s future. Ignoring this relationship may lead to an incorrect analysis of individual behaviours and an equally incorrect analysis of the behaviours of the entire group. Only by recognising these reciprocal influences can we arrive at a more correct analysis of behaviours. The aim of this volume is therefore to explore the contributions of the new approach to various social sciences, to dissect the methodological assumptions on which it is based, and to see if it helps to improve the state of knowledge in those sciences.

This multi-author volume is not simply a collection of independently-written papers. It is the product of close communication between the specialists involved in clarifying the advantages of multilevel analysis: their exchanges shed new light on the approach. We also asked a philosopher of science for a more epistemological contribution—which proved highly relevant—to our methodological work. Our joint efforts lasted more than two years and culminated in a three-day meeting at INED in March 2001. The forum gave us the opportunity to compare our different approaches—often in an impassioned spirit—and to agree on a fuller and more written-up version of our proceedings. We were also able to present the social sciences in a more varied manner so as to avoid excessive repetitions. Of course each author retains sole responsibility for his or her presentation; their opinions, which diverged on certain points, have been included here so as to highlight the constructive side of our disagreements.

Before opening the discussion to our contributors, we will try to outline a very broad opposition between *holism* and *individualism* in the social sciences, and to indicate the richness and relevance of the explanations they allow, as well as the apparent incompatibility of their premises. Next, we show

how more numerous and more complex levels of aggregation can emerge. We conclude with a prelude to the synthesis provided by multilevel analysis, on which the subsequent chapters will elaborate, and give a short presentation of the scope of this volume.

## 1. OPPOSITION BETWEEN HOLISM AND INDIVIDUALISM

The distinction between holism and individualism stems from the fact that a social system can be viewed from two opposite perspectives: either as a totality endowed with specific properties, irreducible to those of its members, or as a set of individuals, such that all social phenomena resolve into individual decisions and actions, without involving any supra-individual factors.

In the social sciences, the initial opposition is between society and the individual—although, as we demonstrate later on, the levels are far more diverse. The important point here is to examine in greater detail, on the basis of this initial distinction, how behaviours are taken into account and what consequences result from it.

### 1.1. *Society*

It seems preferable to begin with the social structure or form, which is already viewed as essential in some of Aristotle's writings. For the philosopher, the State as community (πόλις), under whatever government,

is by nature clearly prior to the family and to the individual, since the whole is of necessity prior to the part; for example, if the whole body be destroyed, there will be no foot or hand, except in an equivocal sense, as we might speak of a stone hand; for when destroyed the hand will be no better than that (*Politics*, book I, part 2, trans. B. Jowett).

Considered as a whole, the community is not an artificial or conventional form, but originates in the demands of human nature: a man who cannot belong to a community "must be either a beast or a god".

In fact, for Aristotle, the individual cannot be the object of any science. He clearly states:

But none of the arts theorise about individual cases. Medicine, for instance, does not theorise about what will help to cure Socrates or Callias, but only about what will help to cure any or all of a given class of patients: this alone is business: individual cases are so infinitely various that no systematic knowledge of them is possible (*Rhetoric*, book I, part 2, trans. W. Rhys Roberts).

It should be noted here that Aristotle often uses the term "art" (τέχνη) as a substitute for the term "science" (ἐπιστήμη), although he occasionally distinguishes between the two: art is more oriented toward "necessity or pleasure"; science is disinterested and aims not to indulge in the pleasures or necessities of life, but rather to discover the structure of things. Incidentally, the modern concept of social science is not present in Aristotle's thought (Granger, 1976).

Closer to us, the macrolevel *par excellence* is society or the State, rather than the community. To take a society as the macrolevel is to regard it as a perfectly defined and organised whole, clearly distinct from the sum of individuals

who compose it, and displaying a powerful internal integration. We can thus deal with this society independently of other contemporaneous societies, and we can treat the social phenomena to be studied as external to individuals. Moreover, these phenomena are of a different nature than individual states of conscience. By contrast, we can compare different societies and highlight their distinguishing features.

We have seen earlier that the purpose of all social sciences is to explain a certain number of behaviours and to analyse the structures in which these phenomena appear. The behaviours and structures are specific to each science, for example: mortality, fertility, nuptiality, and migration, for demography; production, and consumption of wealth, for economics; the dissemination in space and time of diseases, for epidemiology. When we view phenomena at the level of a society, the concrete aspect is represented by the statistical reality of the facts observed in that society. We can classify the facts into two categories, which provide an explanatory framework: (1) the facts that will represent the origin of social facts and the initial conditions observed; (2) the facts that will represent the results obtained under these conditions. The aim here is to use a *model*—which will constitute an abstract virtuality—to describe not only the summary results, but also the processes that lead to these results from the initial conditions.

The origin of social facts must be sought in the formation of the social environment in which they occur. The initial conditions will therefore be supplied by the main characteristics of this environment, which can lead to the phenomena studied and are observed prior to them. The conditions can be measured by statistics describing the state of the society under examination at a given moment. The events studied, meanwhile, can be measured by the proportions of individuals who have experienced them in the following period, which is often very short. For example, the percentages of individuals having displayed a given behaviour (proportion of suicides; proportions of migrants, of persons who have contracted a particular disease, of farmers who have given up farming, etc.), will be linked to certain characteristics that may or may not lead to these behaviours (shares of Catholics and Protestants to explain suicide; percentage of managers or, on the contrary, of farmers to characterise migration; percentages of individuals living in insalubrious conditions or on the contrary in uncontaminated locations to characterise the propensity to contract a given disease; percentages of farm labourers or, on the contrary, of farmers on large holdings to characterise exits from farming).

Thus, when we start from society as an organised whole in order to produce a set of effects under social constraints, our aim will be to show the way in which the society produces a given economic, demographic, social, or other type of fact. More specifically, it is by linking the observed facts to the society of which they are a diverse expression that we will be able to explain and find a basis for their reciprocal effects (Franck, 1994).

Durkheim (1897/1930) sought to relate social facts to the society in which they occur, in order to explain and find a basis for the effect of the religious system, household system, and political system on suicide. To his end, he established a network of links between different factors representing these

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