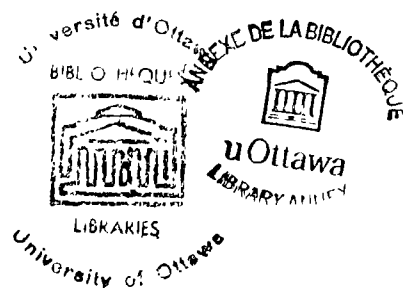


**EPISTEMIC INDIVIDUALITY
IN THE STUDY OF EDUCATION**

by

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Thesis submitted to the School of Graduate
Studies of the University of Ottawa, as partial
fulfillment of the requirements for the degree
of Doctor of Philosophy



Claude Germain, Ottawa, Canada, 1989

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Chapter 1

INTRODUCTION

INTRODUCTION

It is assumed, at the outset, that philosophical inquiry has a great deal to offer to educational research and has something to say on certain issues in the study of education. As a matter of fact, the slow rate of progress in the study of education could be partly due to an absence of philosophical clarity, to some tacit refusal to come to grips with the logical and methodological problems that must face any emerging discipline such as the study of education. The following quotation concerning psychoanalysis can be appropriately applied to educational studies and research: "Where there is no clear canon of procedure, no criteria of evidence, no rules for systematic evaluation, then the very possibility of growth of theory becomes problematic" (Sherwood, The Logic of Explanation in Psychoanalysis, 1969, p. v).

However, the province of philosophical influence must be clearly demarcated. As long as philosophy focuses on methodological and conceptual issues, it remains within its proper field of investigation. A valuable contribution of philosophy, or more precisely of philosophy of science, can be made in the area of methodology and concepts. Hence, the present work will deal exclusively with

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these aspects of educational studies and research which fall within this province of the philosophy of science. Indeed, conceived as an emerging discipline which claims a scientific status, the study of education offers interesting issues to philosophers of science. Furthermore, as the subject is partly related to philosophy of science, philosophy of education, and philosophy of language, some occasional references will be made to these domains whenever their content will be considered relevant. In this sense, the present work can be said to address issues of an interdisciplinary nature.

Individuality

Individuality is a fact of everyday experience. Most of us would not hesitate to claim that there are particulars. If I look around me, I see this pencil, this computer, this telephone, and so on. What I hear is this particular song, this particular voice of my child, this particular noise from the street I live on, etc. What I smell is this specific odor of perfume, what I taste is this specific tomato, and what I touch is this particular book, this particular chair, etc. Many things around me, like shelves, tables, trees, etc. seem intuitively to be individuals. No ordinary person doubts that what is experienced in life are individuals: "Individuality seems to be one of the most fundamental and brute facts of our experience" (Gracia, Individuality, 1988, p. xii).

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INDIVIDUALITY AND UNIVERSALITY

But in addition, there are such things as the quality of the color blue, the property of being a book, the species man, the relation being smaller than, mathematical entities such as numbers, sets, or classes, etc. which philosophers usually call "universals." As a matter of fact, in his treatment of the problem of universals, Plato does not speak of universals, but of "Forms" or "Ideas." Plato's theory of Forms is usually regarded as the first theory of universals, and such a theory is based upon the study of the relationship between universals and particulars. The question of whether qualities and features of things are experienced as individual is still a debatable case.

Whatever the case may be, in the present state of philosophical investigation, one is struck by the absence of a comprehensive or systematic approach to individuality. Indeed, most philosophers have focused their efforts on the so called problem of universals. According to Jorge J.E. Gracia the two major exceptions are Suárez's Metaphysical Disputation V: Individual Unity and Its Principle (in the latter part of the Middle Ages) and, in contemporary philosophy, Strawson's Individuals (1959). However, Jean-Claude Pariente's book - overlooked by Gracia - entitled: Le langage et l'individuel (1973) and Gracia's book totally dedicated to Individuality (1988) should be seen as two more recent exceptions. It seems that every influential philosopher, with a few exceptions, has something to say about

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universals but does not necessarily show any well-marked interest in the correlative notion of individuality. The issue of individuality does not yet occupy a central position in philosophical literature.

EPISTEMOLOGICAL DILEMMA OF INDIVIDUALITY

It is not my intention to provide any account of the historical development of conceptions of the particular, as related to the problem of universals. What should be stressed, for the present purposes, is that knowledge of individuality seems to be on the horns of a dilemma (Granger, [Pensée formelle]*, 1967, p. 185). Indeed, on the one hand some knowledge of the individual is achievable but such a knowledge is not scientific. On the other hand, human facts can be scientifically studied, but in such cases individuals cannot be intellectually captured.

According to French philosopher Gilles-Gaston Granger, such a dilemma is real only if social sciences are conceived as speculative disciplines: "A speculative science of the individual is impossible" (Granger, 1967, p. 185 - underlined by author). In this sense, Aristotle's aphorism is true: knowledge is of the universal.

* By convention, for an efficient mode of reference not only author's name, date and page will be given in the text, but also the title in an abridged form enclosed in square brackets which corresponds to the abridged form given in the REFERENCE section of this work (for an unabridged title: no square brackets).

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However, if the study of human or social facts is seen as a domain of APPLIED KNOWLEDGE, the epistemological dilemma of individuality vanishes. Indeed, when a science addresses a practice, it necessarily deals with individualities (Granger, p. 186). Within the natural sciences, the concept of individuality is not central, less manifest and less complex. Within the social sciences - and the study of education is conceived as a social discipline - individualities can be taken as objects of scientific inquiry: "It is the... process of integration into a practice which finally opens the road to a scientific conception of individuality" ["c'est le... processus d'intégration dans une pratique qui ouvre ici la voie à une conception enfin scientifique de l'individuel"] (Granger, p. 186 - personal translation).* In other words, when applied knowledge is involved, individualities are involved. Such is the case in psychology, psychoanalysis, medicine, sociology, linguistics, economy, and education: "A rational knowledge of the individual, argues Granger, is achievable only within a practice" ["la connaissance de l'individuel n'a de sens rationnel qu'à l'intérieur d'une pratique"] (Granger, p. 196). Such is the basic assumption that will be endorsed in the present work.

* Whenever quotations are borrowed from French references which are not available in English, I shall give my own translation of the quotation, followed by the original version enclosed in brackets.

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Nevertheless, it must be stressed that Granger's conception of applied knowledge will not be totally supported here. Indeed, Granger's view rests upon a distinction between two separate levels: the level of elaboration of concepts, and in a further step the level of their application to a domain of practice. The difficulty with such a conception is that the elaboration of concepts is conceived as a separate phase from their application.

As suggested by another French philosopher, Jean-Claude Pariente, such a view implies the dissociation between the elaboration of a language (and its concepts) from the determination of individualities to which such a language could be applied. Therefore, such a perspective would be incompatible with a formal conception of individuation which seems necessary to deal properly with the issue of individuality. Following Pariente's view, it will be assumed that conditions of application of concepts must be integrated into the procedures of elaboration of concepts.

According to Pariente, individuality is not a natural property or a predicate inherent in some material object: individuality must be conceived as the product of a conceptual procedure of individuation by means of language (Pariente, p. 6). The nature of an individual is not necessarily biological or anthropological: it is not essentially a human being or a person. On the contrary, individuality is a property that is given to an entity if and when such an entity is the object of a procedure of

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individuation. Individuality is not a property inherent in the nature of things or in experience, but is the result of an act of individuation by means of a linguistic procedure. Individuality is a property which can be given (but not necessarily) to a person or human being, and to a material object. Individuality is an object of conceptualization, not of empirical perception (p. 41).

Pariente's formal conception of the individual has to be linked to the type of language used because a procedure of individuation reaches consciousness in a linguistic form. This is why, claims Pariente, different usages of language (for instance, ordinary, scientific, and literary uses) give rise to different procedures of individuation. Within Pariente's perspective, individualities are not simply seen as spatio-temporal entities. Furthermore, as it will be explained in chapters 6 and 7, the conceptual universe must be articulated with - not separated from - the universe of individuals (Pariente, pp. 148-150).

In dealing with the study of education conceived as an applied science, my primary concern is, contrary to a perennial philosophical tendency, with the individual rather than the universal. Even if these two concepts - universality and individuality - are like the two faces of the same coin, it remains that, from an epistemological perspective aiming at clarifying practical problems of knowledge applied to the study of education, it seems

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more promising to tackle the issue of knowledge from the perspective of particulars.

The present investigation could be seen as an attempt, as a whole, to deal with issues raised by Plato. If one could come up with at least one example of a genuine knowledge of particulars, that would seem sufficient to reply to Plato's theory of Forms, according to which there can be no genuine knowledge of particulars: particulars (contrary to Forms) are transient, dependent, and in a state of continual change. Particulars, according to Plato, cannot be objects of genuine knowledge. The only genuine knowledge achievable is knowledge of permanent, eternal and changeless entities, such as knowledge of the Forms. The best that can be achieved, in the case of particulars, is only true opinion. In sum, Plato's theory of Forms claims the impossibility of achieving a genuine knowledge of particulars.

However, within the perspective of applied knowledge as suggested by Granger and within Pariente's formal conception of individuality, it seems reasonable to attempt achieving some type of scientific knowledge of individuals:

As the idea of an applied science develops, the problem of individual realities is re-introduced within the province of scientific knowledge (Granger, p. 200).

(Mais à mesure que s'actualise la figure d'une science appliquée, le problème des réalités individuelles se trouve réinstallé à l'intérieur même du territoire scientifique).

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An attempt will be made to establish that a genuine knowledge of particulars is achievable. In proceeding with a close examination of the way a few social sciences apparently succeeded in different degrees to intellectually capture individualities, my contention is that a genuine knowledge of particulars is not only possible, but desirable (contrary to Plato's belief):

Science is moving towards the construction of a concept of the individual, and such a construction makes sense only in the perspective of an applied knowledge (Granger, p. 204).

(La science s'oriente vers la construction d'un concept de l'individuel, et cette construction n'a de sens que dans la perspective d'une connaissance appliquée).

It is for the rest of the present work to substantiate this claim.

Individuality and the Study of Education

The treatment of individualities within a specific domain of scientific investigation such as the study of education remains to be done. Based on the assumptions mentioned in the previous paragraphs, the problem to be examined is the following: if it seems possible to intellectually capture individualities insofar as one is dealing with applied knowledge, and if the study of education is conceived as a domain of applied knowledge, what treatment is given, in actual fact, to individualities in the

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study of education? In other words, how do educational researchers deal with the issue of individuality? Is a genuine knowledge of particulars actually achieved in the study of education? To what extent can we consider the field of education as an exemplar of a scientific conception of individuality? If not, how could we successfully contribute to such a goal?

However, before undertaking such a study, it must be remembered that "education" (understood as formal education) must be distinguished from "the study of education." Education comprises a broad range of practical activities like planning, implementing, teaching, evaluating, etc. The grouping of these numerous activities into different research domains, fields of study, disciplines or sub-disciplines is a matter of continuous dispute. According to some scholars, educational knowledge is realized through three "message systems": curriculum, pedagogy and evaluation. Some others make a distinction between "curriculum" and "instruction," seeing the "evaluation" aspect as a component of the instructional system. For many, "curriculum" and "instruction" should be kept separated for analytic clarity whereas according to others, their separation is superficial since in practice curriculum and instruction are thoroughly intertwined. The term "curriculum" (and the same remark can be applied to the term "instruction") has many meanings, which reflect a great variety of viewpoints.

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At the present time, there seems to be no rational or coherent principle of organization of educational activities. Hence the adoption of one classification instead of another is more or less a matter of personal preference, interest or belief. The only kind of tacit agreement among educational researchers seems to be that "if curriculum emphasizes ends to be acquired, then instruction is a principal means of acquisition" (Schubert, Curriculum Research, 1982, p. 424). In the present work, although the interdependence of instruction and curriculum is fully recognized in practice, for heuristic or methodological reasons they are considered as separate - but related - research domains. The study of education will therefore be examined from two broad perspectives, namely "curriculum studies" and "the study of teaching."

CURRICULUM STUDIES

There are numerous definitions of curriculum and a few approaches have been developed in the past concerning curricular studies. According to George J. Posner (Curriculum knowledge, 1985), the current prevailing conceptions of curriculum are the following: "the means-end approach" usually designated as the Tyler "rationale" (Tyler, [Basic Principles], 1950), "the naturalistic approach" derived from Walker's studies (Walker, [A naturalistic model], 1971), "the analysis-of-experience approach" attributed to a group of curriculum theorists termed "reconceptualists" (Pinar, [The Reconceptualists], 1975), "the preconceptions

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approach" (Driver and Easley, [Pupils and paradigms], 1978), and "the epistemological approach" with Joseph J. Schwab (Schwab, [The Practical 1, 2, 3 and 4], 1970, 1971, 1973, and 1983).

For the present purposes, the choice is more or less obvious. Indeed, it is with the epistemological approach that one has better chances of discovering some interesting considerations concerning the issue of knowledge and some philosophical treatment of individuality. Schwab is presently recognized as an intellectual leader in the area of curriculum studies, who still exerts a strong influence on the field's conception of curriculum development knowledge. He is among the most influential thinkers concerning the theory and practice of curriculum, who made an important contribution to educational theory: he combines the Aristotelian distinction between "the theoretical" and "the practical" with John Dewey's pragmatism (Schwab, [College Curriculum], 1969). As teacher of philosophy of education he discusses the ends of education in terms of three commonplaces: conceptions of the individual, of society, and of knowledge. For the present purposes, the emphasis will be put on his conception of knowledge of the individual. This explains why Schwab's view of curriculum was the one chosen to be examined (Chapter 2).

THE STUDY OF TEACHING

In the area of study of teaching, the task of choosing authors to be discussed is more complex. Indeed, there is more than one

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approach to address the issue of teaching but none of them can be clearly identified as an "epistemological approach." In the study of teaching, empirical research, classified in a few complementary "paradigms," are involved. This gives rise to a terminological problem, which must be settled first.

Paradigm and research tradition

"Paradigm" is without doubt one of the most frequent terms used by scholars when discussing educational research activities.* However, at the present time it is difficult to understand precisely what "paradigm" means, and there are probably as many conceptions as authors. Thomas S. Kuhn contributed largely, in The Structure of Scientific Revolutions, to its popularization among philosophers of science and scholars of many other disciplines. However, in her attempt to elucidate Kuhn's notion, Margaret Masterman found that even Kuhn uses the word in many different ways, more precisely: twenty-one, falling into three main groups (The Nature of a Paradigm, 1970). As a matter of fact, Kuhn himself proposed to replace the word "paradigm" at least in its metaphysical sense with the less confused phrase

* It is interesting to note that in educational research, independently of Kuhn's suggestion, Nathaniel L. Gage used and proposed the word "paradigm" as early as in 1963, in the first edition of the Handbook of Research on Teaching (Gage, [Hard Gains], 1985, p. 41).

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"disciplinary matrix," and claimed that the only restricted sense in which "paradigm" should be employed is as a synonym of "exemplars" ([Second Thoughts], 1974, pp. 463 and 471).

Under the circumstances, following Gary D. Fenstermacher's usage ([Philosophy], 1986, p. 41), it would seem preferable to adopt the more precise notion of "research tradition" as developed by philosopher of science Larry Laudan:

a research tradition is a set of general assumptions about the entities and processes in a domain of study, and about the appropriate methods to be used for investigating the problems and constructing the theories in that domain. (Laudan, [Progress], 1977, p. 81)

For example, according to Laudan's working definition, behaviorism, cognitive psychology and humanistic psychology could be considered as different research traditions. In the following pages, the expression "research tradition" will therefore be used instead of the rather ambiguous term "paradigm".

Research traditions in the study of teaching

The most interesting synoptic map of empirical research on teaching is without doubt the one given by Lee S. Shulman in the introductory chapter of the third edition of the recent Handbook of Research on Teaching (1986). The author presents, analyzes and criticizes five currently competing research traditions in the study of teaching. The first three, which draw their models

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mostly from psychology - teacher effectiveness program, research program on academic learning time, and student mediation program - can be said to "share a fundamental family membership in the process-product tradition" (Shulman, [Paradigms], 1986, p. 18). Without totally avoiding some inevitable reductionism and oversimplification, these three research traditions will be considered as representative of a unique movement, which can be designated as the nomothetic approach.

Terminology used here (from the Greek word nomos, "law") leads to a focus on the idea that these research traditions aim at the discovery of laws or regularities, more or less general across individuals. As Michael J. Dunkin and Bruce J. Biddle put it,

although each teaching situation, each classroom, indeed each pupil, is a unique event, in many ways the process of teaching is surprisingly invariant across the United States and throughout the Western world. ([Teaching], 1974, p. 32)

Furthermore, the three mentioned research traditions are both empirical and inductive. They are empirical in the sense that knowledge achieved is based on experience through the senses (essentially, visual observations). They are inductive, as it will be explained further with more details, in the sense that general knowledge is achieved through inferences from observations of particular cases. As Gage is considered by many

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educational scholars as one of the most prominent leaders of the process-product orientation, I shall mainly make reference to his conception.

These research traditions are often designated by some scholars as "positivist." However, as convincingly shown by Denis C. Phillips, there are many forms of positivism (Comtean-type positivism, logical positivism, behaviorist-type, and empiricist-type), and it is not always clear what type of positivism is involved. At any rate, "it is clear that logical positivism is a type of empiricism, and that not all varieties of empiricism are positivistic" (Phillips, [Postpositivistic], 1983, p. 6). As the type of empirical research involved in the process-product research tradition is more or less ambiguous concerning both the status of theoretical entities (many logical positivists were not realists on this complex issue) and the attitude toward metaphysics (logical positivists were hostile toward metaphysics), it would be presumptuous to call it positivistic.

Alternative research traditions, identified by Shulman as "studies of classroom processes as ecological systems or as language communities," belong to a very different intellectual tradition of inquiry mainly derived from anthropology, sociology and linguistics. Moreover, the methodology is more often qualitative than quantitative. These studies will be referred to as exemplifying the idiographic approach.

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Again, present terminology (from Greek idio-, "one's own, personal, distinct") aims at emphasizing the fact that the idiographic approach in education is concerned above all with the understanding of a particular classroom instead of regularities among a great variety of classrooms. Furthermore, the idiographic approach can be said to be partly empirical, that is, partly based on sense experience as the process-product approach is. However, when it attempts at giving some interpretation of the meaning-perspective of the participants involved, the approach leaves its empirical foundation (epistemological issues involved with the adoption of such a procedure will be discussed in Chapter 4).

Therefore, whenever Frederick Erickson, one of the leaders of the interpretive orientation in education, claims that his work "is an attempt to be empirical without being positivist," and when he qualifies the rival approach (the process-product approach) as "positivist/behaviorist," he is partly accurate (Erickson, [Qualitative Methods], 1986, p. 120). He is only partly correct in mentioning the empirical character of the interpretive approach, and he is hasty when he qualifies the process-product research tradition as being "positivist."

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The last research tradition analyzed by Shulman - the study of teacher cognition and decision making - mostly inspired by information-processing and cognitive psychology, is partly linked to the process-product tradition and partly linked to the sociolinguistic and ethnographic tradition. This explains why Shulman does not hesitate to reduce to only two general strategies the five research traditions currently pursued in the study of teaching (Shulman, p. 18). Following Shulman's initiative, I shall consider the actual variety of empirical research traditions in education as reducible to two broad categories, namely the nomothetic and idiographic approaches. During the past decades, the process-product research was without doubt "the central and most active program," "the most vigorous and productive of the programs of research on teaching." However, at the present time it seems "to be losing intellectual vigor within the research community" while alternative approaches - such as the idiographic - gain increased attention and utilization among the new generation of scholars (Shulman, pp. 9 and 12).

Finally, it must be stressed that the nomothetic and idiographic orientations in educational research can be linked to two broad research traditions within the philosophy of social sciences, mainly inspired by Comte, Malinowski, Durkheim on the one hand, and by Dilthey, Rickert, and Weber on the other hand. In their turn, these two research traditions in the study of the social or human world have their own origins in two different basic

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philosophical traditions, namely, empiricism - Newton, Locke, and others - and idealism - Kant and some other idealist philosophers (Smith, [Research], 1983, p. 6). Thus nomothetic and idiographic approaches in the study of education should not be seen as isolated attitudes towards science. In fact, their major presuppositions can be identified with the characteristics of their epistemological roots, as it will be seen in Chapters 3 and 4.

The object of the present essay is to spell out the epistemological assumptions underlying the issue of individuation within the social sciences, principally educational studies and linguistics, in order to examine conditions for the achievement of a genuine or scientific knowledge of the individual in education. In order to achieve this goal, three broad categories will be firstly examined, one dealing with the issue of curriculum - the curricular [or philosophical] perspective illustrated by Schwab's conception - and the two other categories dealing with instruction (or teaching) - the empirical perspective illustrated by Gage's nomothetic view and Erickson's idiographic perspective. For each of these views, the status and treatment of individuality will be examined.

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Chapter 2 will deal with Schwab's conception of curriculum, designated as the practical approach. I shall claim that, in the philosophical conception, Schwab's treatment of individuality is interesting only from the perspective of action. As long as concrete action is the ultimate goal assigned to educational research, Schwab's practical perspective seems appropriate. However, there is no contribution insofar as scientific knowledge of individuals is concerned.

With Gage's perspective (Chapter 3), the issue of individuality is not seen as an interesting problem to be investigated, as the aim of educational research within nomothetic perspective is the achievement of regularities or universal tendencies (or laws). As long as regularities among individuals or groups is the ultimate goal assigned to educational research, the nomothetic approach seems appropriate. However, the issue of individuality is neglected.

With Erickson's perspective (Chapter 4), contrary to Gage's perspective, emphasis is put on individualities. However, the goal of empirical research is understanding the meanings-in-action of actors involved in a specific milieu. Therefore, as long as understanding is the ultimate goal assigned to educational research, the idiographic approach seems appropriate. Knowledge of individuals qua individuals is nevertheless ignored.

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As none of the three broad perspectives actually involved in the study of education leads to a genuine knowledge of the individual, in the remaining part of this essay I shall investigate the way another social science, namely linguistics, seen also as a domain of practical knowledge, deals with the issue of individuality.* I shall proceed with a close examination and analysis of the way linguistics apparently succeeds in achieving a scientific knowledge of individualities. My contention is that a genuine knowledge of particulars is not only possible but desirable, as long as a theory and a model are involved.

In this respect, it will be shown that two approaches can be used in order to achieve some knowledge of the individual. Chapter 5 will illustrate, on the example of a very well known psychological tool, the Rorschach test, the differences between two complementary types of knowledge usually involved in scientific disciplines: "knowledge by system," and "knowledge by model," according to Pariente's terminology. In the last part of this chapter, both Jakobson's theory of phonological features and the COLT scheme in second language teaching will illustrate the former type. The conclusion will be that, if knowledge of the

* The majority of American philosophers of science deal with epistemological problems exclusively related to the natural sciences. Pariente's view is also interesting in that the majority of his examples are borrowed from the social sciences.

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individual as a member of a class is the goal to be assigned to educational research, knowledge by system that is, a taxonomic approach, would deserve to be taken into account.

In chapter 6, the latter type - knowledge by model - will be explained: the case of the Leyden jar, in the domain of the natural sciences, will be used to define a few technical terms of Pariente's theory of individuality. Then, Pariente's conception will be applied to Henriette Walter's phonological analysis of idiolects in order to show how the process of individuation can be involved in knowledge by model, in the area of linguistics.

Chapter 7 will deal with the introduction of two key notions of Pariente's theory of individuality: the related concepts of theory and model. My contention is that in order to achieve some genuine knowledge of the particular - or the individual - it is necessary to make reference to a theory and a model (chapter 7 will be precisely devoted to the distinction between theory and model, and their relationship). It will be assumed that no sound study of the individual or the "concrete particular" can be undertaken without recourse to a theory and a model.

The last chapter will attempt to draw some conclusions from the previous analyses in order to see how Pariente's theory of individuality can shed new light on the issue of individuality in education.

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In general, it will be shown that in the study of education, four complementary attitudes toward the issue of individuality are usually adopted: practical, nomothetic, idiographic, and taxonomic. The first three are represented respectively by Schwab's, Gage's and Erickson's conceptions. The fourth one, the taxonomic approach concerned with knowledge by system, is also current among a few educational scholars.

In order to achieve some genuine knowledge of the individual, an alternative will be devised. Such an approach, based on Pariente's philosophy, will be called the "idiologic approach".* The conclusion will be that, if knowledge of the individual qua individual is the goal to be assigned to educational research, knowledge by model that is, an idiologic approach, would seem to be a fruitful approach (Chapters 7 and 8).

Finally, it must be mentioned that a study of the problem of individuation grounded on a solid epistemological documentation cannot be accomplished without a theory of individuation. As a promising theory of this type has been outlined (in 1973) by Pariente, most of the basic concepts and distinctions set forth in chapters 5, 6 and 7 will be drawn from his book, entitled: Le langage et l'individuel. Indeed, Pariente proposes an original

* "Idiologic" is a neologism which seems necessary in the context of the present discussion.

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method of epistemological analysis which aims at establishing the way scientific theories, mainly borrowed from the social sciences, deal with "the concrete particular," that is, with their individualities. In the present study, Pariente's method will be tested in the field of linguistics (which is not developed in his book) and, finally, an attempt will be made to apply his conclusions to the field of education.

Chapter 2

THE PRACTICAL APPROACH

THE PRACTICAL APPROACH

In this chapter, the epistemological approach adopted by Schwab in the domain of curriculum studies will be presented and briefly discussed, in order to examine the status and the role given to individuality. Schwab's central thesis is that failure of education is mainly due to its reliance on the theoretic. According to him, there is a disparity between the theoretical and the practical. Education only deals with practical problems. In order to address educational issues, theories are ill-fitted and inappropriate, inadequate where appropriate, and not unified where adequate. This is why, claims Schwab, other modes of operation must be devised, namely, "arts of the practical" (or the "quasi-practical"), and "arts of eclectic." Within such a perspective, the goal assigned to curriculum studies consists in taking concrete decisions or actions in order to solve practical educational problems. This explains why Schwab's perspective has been named here: the practical approach. Even if a lot of attention is devoted to individuals, or "particulars," within his philosophy, it remains that individuals are conceived as objects of some decision or action - not as objects of knowledge. There is no real attempt to achieve some type of knowledge of the individual.

Failure of Education

According to Schwab, the incoherence of the curriculum and the failure and discontinuity in schooling come from the reliance of education on what he calls the theoretic: "Education in general and the field of curriculum in particular have been inveterately theoretic and (...) this theoretic bent has let education down" (The Practical 2, 1971, p. 322). If practical educational problems have been so poorly solved, it is due to the fact that educators have addressed theories of curriculum, theories of teaching and theories of learning as if educational theories could tell the practitioner what to do and how to do it.

Immense difficulties in education come from theoretic activities. Indeed, explains Schwab, many theories from different areas outside the field of education were borrowed by educators: theories concerning learning, knowledge, mind, personality, political and social structure, ethics, etc. These adopted theories attempt to solve particular classroom or school problems. Another type of theoretic activity has been to construct educational theories, which have been used the same way borrowed theories have been used. In both cases, the result has been failure.

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Much of the failure in education, states Schwab, can be traced to marked incongruities or disparities between theory and practice. The consequence of this total absence of relationship between the two is that "the field of curriculum is moribund" (The Practical 1, 1970, p. 287). In other words, with its present principles and methods, based on the theoretic, educational research cannot make any significant contribution to the development of education. New principles and new methods are required.

Mistaken Reliance on Theory

Before mentioning the type of solution suggested by Schwab, his position concerning the role of theories in education should be carefully examined. Indeed, according to Schwab, educational difficulties result from the operation of three factors: to solve educational problems, theoretical constructions are 1) ill-fitted and inappropriate, 2) inadequate where appropriate, and 3) not unified where adequate. Each aspect of his argumentation will be taken into consideration in the following paragraphs.

THE THEORETIC: ILL-FITTED AND INAPPROPRIATE

In order to emphasize his point of view, Schwab makes a contrast between the practical mode and the theoretic mode, concerning outcome, subject matter, problems, and methods.

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Outcome

The goal of the theoretic is to achieve knowledge, under the form of general or universal statements supposedly true or warranted. Such statements are good for long periods of time and applicable unequivocally to each member of a class of occurrences.

In the practical mode, the outcome consists of in a decision, that is, "a selection and guide to possible action" (The Practical 1, 1970, p. 288). Contrary to the situation within the theoretic, a decision does not last forever and is not subject to extensive application. A decision can only be applied unequivocally "to the case for which it was sought" (p. 288). Applications to other cases can only be made by analogy.

Subject matter

According to Schwab, the subject matter of the theoretic is either universal, or extensive, or pervasive. Among the universals are scientific concepts such as mass, time, class, etc.; among the extensive are concepts of Homo sapiens, igneous rock, etc.; among the pervasive are concepts of electrons and protons (The Practical 1, 1970, p. 289). Furthermore, theoretical investigation deals with its subject matter as if it were constant from one case to the other and indifferent to changing conditions. A theory achieves a certain level of generality precisely by omitting much of the concrete particulars, by a process of abstraction or idealization. It is precisely in

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virtue of what they leave out that the practical value of theories is vitiated.

Furthermore, the generality of theory varies widely: at one extreme, one can find all encompassing constructions such as Euclid's postulates or Freud's view of the psyche and, at the other extreme, empirical generalizations, delimitations of species and genera, etc. Whatever the case may be, generalities are always achieved by a process of abstraction. For instance, in Euclidean geometry, treatment of plane figures leaves out the particular size of one figure or another. Also, "species are differentiated and defined on the basis of only some differences and similarities" (The Practical 2, 1971, p. 324 - underlined by author).

As theories deal with universality, that is with the elements common to all members of a universe, and with regularities, that is with recurrent events or objects, they necessarily ignore the locality of instances and the unique object or the occasional event. In other words, mentions Schwab, a theory contains little of the concrete particulars which characterize education:

All theories, even the best of them in the simplest sciences, necessarily neglect some aspects and facets of the facts of the case. A theory covers and formulates the regularities among the things and events it subsumes. It abstracts a general or ideal case. It leaves behind the nonuniformities, the particularities, which characterize each concrete instance of the facts subsumed (The Practical 1, 1970, p. 309)

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Such was the case, for instance, with classical mechanics which dealt with a body in "free" fall. Such was also the case with the rule of light energy which is only valid for an imaginary point-source of light. What is true for the natural sciences, argues Schwab, is true a fortiori for the social sciences in general and for education in particular, whose subject matter is both more variable and more complex.

However, educational problems arise in concrete situations, at a particular time, at a particular place, with particular persons. Diversity is what characterizes education: diversity of needs, of resources, of schools, of pupils, etc. Therefore, attention should be given to "the local," that is, to local students of a local school, in a specific town or district:

The subject matter of the practical... is always something taken as concrete and particular and treated as indefinitely susceptible to circumstance, and therefore highly liable to unexpected change: this student, in that school, on the South Side of Columbus, with Principal Jones during the present mayoralty of Ed Tweed and in view of the probability of his reelection. (The Practical 1, 1970, p. 289)

Therefore, curriculum must bear "on the real thing," "on the concrete case" and not on "ideal or abstract representations." Education does not deal with "some archetypical classroom, but in a particular locus in time and space" (The Practical 1, 1970, p. 310). Education is concerned with individual children, not with the generic child. We do not teach literature "but this novel

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and that" (The Practical 2, 1971, p. 324). In general, the argument can be summarized as follows:

The stuff of theory is abstract or idealized representations of real things. But curriculum in action treats real things: real acts, real teachers, real children, things richer than and different from their theoretical representations. Curriculum will deal badly with its real things if it treats them merely as replicas of their theoretic representations. (The Practical 1, 1970, p. 310)

Problems

With the theoretic, problems arise from the academic field itself, that is, from what we already know in a specific area of study. They come from the evolution of the discipline. Problems, states Schwab, are "states of mind" (The Practical 1, 1970, p. 289).

With the practical, problems arise from "state of affairs" which "are constituted of conditions which we wish were otherwise and we think they can be made to be otherwise" (The Practical 1, 1970, p. 289 - underlined by author). Practical problems are not given: they are taken.

Methods

In the theoretic, the methods used in the pursuit of knowledge - loosely called "induction" - are numerous. However, they are characterized by a common feature: "control by a principle" (The Practical 1, 1970, p. 289). It is the principle adopted in a

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theoretic enquiry which determines the nature of the problem to be examined, the type of data to seek, the way these data should be interpreted, etc.

In the practical, the method is called "deliberation." It is neither inductive, nor deductive:

It cannot be inductive because the target of the method is not a generalization or explanation, but a decision about action in a concrete situation. It cannot be deductive because it deals with the concrete case and not abstractions from cases, and the concrete case cannot be settled by mere application of a principle, for almost every concrete case falls under two or more principles, and is not, therefore, a complete instance of either principle. (The Practical 1, 1970, p. 318)

Deliberation, adds Schwab, is a complex and arduous process, dealing with both ends and means, and aiming at generating alternative solutions to a problem which has firstly to be identified.

In brief, according to Schwab, the issues of outcome, subject matter, methods and problems are totally different in the theoretic and the practical modes. There is "incongruity of theory and practice," a "radical difference" between the two; there are "disparities between real thing and theoretic representation" (The Practical 2, 1971, pp. 323 and 324; The Practical 1, 1970, p. 310).

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THE THEORETIC: INADEQUATE WHERE APPROPRIATE

As mentioned earlier, according to Schwab most of the actual difficulties in education result from the fact that, to solve problems, theoretical constructions are 1) ill-fitted and inappropriate, 2) inadequate where appropriate, and 3) not unified where adequate. In the foregoing paragraphs, the first characteristic of the theoretic, within Schwab's perspective, has been examined. In this section, I shall present the second part of Schwab's argumentation: if and when appropriate, theories are inadequate.

According to Schwab, the inadequacy of borrowed theories in education arises from two sources: the incompleteness of the subject matter of theories, and their partiality of view.

Incompleteness of subject

For purposes of scientific investigation, the outcomes of theories are separated: "This separation of the whole of human affairs into subjects of various sciences is not a fault of these sciences but a condition of all scientific enquiry" (The Practical 2, 1971, p. 33). In other words, each theory deals with a different subject matter. Some curriculum theories concern the individual, others concern groups, others concern cultures, societies, minds, etc. In focussing on one specific subject, a theory necessarily neglects some aspects of the problem under investigation. In that sense, claims Schwab, the

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theoretic is incomplete. For instance, most cognitive learning theories do not take into account emotional needs and satisfactions; economic theories ignore emotional and cultural factors which could affect the nature of demand; personality theories reduce the whole of a society to a simple appendage of personality; sociological theories reduce the importance of personality; and so on with other types of theories. Problems of personality are usually ignored by theories of knowledge. Many theories omit what others include.

It follows that such a body of incomplete knowledge, taken separately, can only be imperfectly applicable to practical problems, which arise "in the whole web of the original complexity" (The Practical 2, 1971, p. 330). In order to resolve educational problems, which constitute "one complex, organic agency," it would be inadequate to draw on only one theory while ignoring others" (The Practical 1, 1970, p. 307).

Partiality of view

Furthermore, within theoretic construction, the specific point of view adopted by the theoretician makes it difficult to take into account related aspects. For example, the adoption of a Freudian treatment of personality is hardly reconcilable with an adequate treatment of interpersonal relations. At the opposite, interpersonal theories make it difficult to deal with autonomy of behavior and feelings (The Practical 1, 1970, p. 296).

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In sum, Schwab's conception is that incompleteness of subject and partiality of view are two important weaknesses which vitiate the use of theory in the making of decisions.

THE THEORETIC: NOT UNIFIED WHERE ADEQUATE

Finally, according to Schwab, even where a borrowed theory is adequate to its subject matter, it remains that "it begs or ignores questions about other subject matters" (The Practical 1, 1970, pp. 287-288). For example, as seen previously, theories of personality usually ignore issues related to social structure and ethics, which are matters always involved in schools. But the present problem arises from the fact that theories concerning educational matters (mind, knowledge, values, social and political structure, etc.) "cannot be combined into a unified theory adequately covering all of them" (The Practical 1, 1970, p. 288). Social sciences are characterized by the coexistence of competing theories: there are many theories of personality, several theories of groups and half a dozen theories of learning. It follows that every theory makes its own selection of data according to its own principles of enquiry:

Each asks different questions of the subject and gives rise to different answers. In consequence, a plurality of theories arises in each behavioral science, each one incomplete, each throwing its own light on the subject. (The Practical 2, 1971, p. 331).

The expected result can only be "a tunnel vision" (The Practical 2, 1971, p. 333).

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Social sciences are characterized by a proliferation of "schools" of thought. Each one is distinct from the others "by a different choice of principle of enquiry, each of which selects from the intimidating complexities of the subject matter" (The Practical 1, 1970, p. 311). In other words, competing theories or "schools" deal with different aspects of a concrete situation and treat them in a different way, according to their own principles. Pluralities of theory, concludes Schwab, emphasize the fact that a specific theory cannot deal properly with the whole of human behavior, in two respects:

In the first place, it would not comprehend what there may be of human behavior which we do not see in virtue of the restricted light by which we examine behavior. In the second place, such a single theory will not only seek its data in the restricted light of its principles, it will also necessarily interpret its data in the light of its one set of principles, assigning to these data only one set of significances and establishing among them only one set of relations. (The Practical 1, 1970, p. 311)

There is a lack of theoretical connection: theories are unconnected, separate. It follows that theories cannot tell the educational practitioner - dealing with a varied and complex whole - what to do and how to do it.

In general, Schwab's argument is founded on the way he characterizes theory, and on his conception of the disparities between real educational objects or events and their representation in theory: "The practical is always marked by particularity, the theoretical by generality" (The Practical 2, 1971, p. 324).

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Necessity of Other Modes of Operation

Having analyzed the characteristics of theory and having emphasized disparities between real things and their representation, Schwab concludes that "curriculum energies must be diverted from the theoretic" (The Practical 1, 1970, p. 310). The theoretic should be replaced by "the practical."* Basically, theory deals with abstract representations but education has to treat real things or events, happening in concrete situations. The "concrete case" is seen as the heart of the practical (The Practical 1, 1970, p. 312). Schwab's thesis is that a renaissance of the field of curriculum is still achievable "only if curriculum energies are in large part diverted from theoretic pursuits" (The Practical 1, 1970, p. 288).

ARTS OF THE PRACTICAL

As seen previously, the outcome of the practical or the quasi-practical is a decision (as opposed to knowledge), its subject matter is taken as concrete and particular (as opposed to general), its problems are states of affairs (as opposed to

* Schwab devoted a series of four articles to this issue: 1) The Practical: A Language for Curriculum (1970); 2) The Practical: Arts of Eclectic (1971); 3) The Practical: Translation into Curriculum (1973), and 4) The Practical 4: Something for Curriculum Professors To Do (1983).

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states of mind), and its methods involve deliberation (as opposed to induction).

The "practical" - or the "quasi-practical"* - makes reference to the resolution of very specific problems, in particular settings or situations. The purpose of arts of the practical is to supplement theory. Every art has rules but

art arises as the knower of the rules learns to apply them appropriately to the particular case. Application, in turn, requires acute awareness of the particularities of that case and ways in which the rule can be modified to fit the case without complete abrogation of the rule. (The Practical 4, 1983, p. 265, footnote 2 - underlined by author)

Here again, when dealing with the issue of arts of the practical, Schwab emphasizes the local or concrete character of educational or curriculum problems: "questions of what and how to teach arise in concrete situations loaded with concrete particulars of time, place, person, and circumstance" (The Practical 2, 1971, p. 322).

As theory deals with abstract representations, a supplement is required in order to bring a theory to its application. The arts of the practical consist in 1) identifying the disparities between a concrete case and its idealized representation,

* By the "quasi-practical" Schwab makes reference to the extension of practical methods "to subject matters of increasing internal variety": for instance, a whole school system, all the schools of an entire state, heterogenous groups, etc. (The Practical 1, 1970, p. 291).

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2) modifying the theory to fit specific needs, and 3) devising ways of taking into account the multiple facets of a concrete situation.

ARTS OF ECLECTIC

The purpose of "arts of eclectic" is to ready theory for practical use. Distortions and limited perspective imposed on its subject by a theory are discovered and taken into account. Arts of eclectic are "arts by which useful parts of diverse bodies of theoretic knowledge are put together in relation to a practical problem of curriculum" (The Practical 4, 1983, p. 259).

At this point, it is important to observe that eclectic thinking recognizes the usefulness of theory to educational decisions. Indeed, according to Schwab, theory has two major uses in decision making or guiding action. Firstly, theories are used as bodies of knowledge. For instance, Freud's theory can be used as knowledge of personality, as well as Skinner's theory can be used as knowledge of the learning process. Theories provide a kind of shorthand for some phases of deliberation. Secondly, the terms and distinctions made within a theory can be used in practice. For instance, Bacon's distinction of memory, reason, and imagination can be used as a basis to divide subject matters into three corresponding aspects: historical, scientific, and literary.

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Furthermore, the eclectic takes into account certain weaknesses of theory, and "repairs," to a certain extent, these weaknesses:

First, eclectic operations bring into clear view the particular truncation of subject characteristic of a given theory and bring to light the partiality of its view. Second, eclectic operations permit the serial utilization or even the conjoint utilization of two or more theories on practical problems. (The Practical 1, 1970, p. 297)

The eclectic begins with the identification of terms and distinctions of a theory. Then, it goes into either of two directions: it may concern itself with the appropriate application of different competing theories to different particular problems, or it may deal with theories of different but related subject matters, that is, with theories constructed in other sciences, to solve problems left aside by the initially treated theory (e.g., theories of society, of culture, etc.). In this respect, eclectic operations make possible

the practical conjunction of some theories of one part-subject with some theories of other part-subjects without having to wait on a unified theory of the united whole. (The Practical 1, 1970, p. 299).

According to Schwab, arts of eclectic allow the educational practitioner to make "sophisticated" use of theories.

In general, Schwab's conception can be formulated as the following argument:

Theories only deal with the general;

Educational problems concern the concrete particular;

Theories as such are not suitable for educational problems.

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In order to deal with educational problems, insists Schwab, energy must be diverted from theoretic pursuits. Other modes of operation - the practical, the quasi-practical, and the eclectic - are necessary. In sum, drawing together the various strands of argument developed by Schwab, it can be concluded that his main thesis concerns the marked disparities between the practical and the theoretic. The failures of education can be traced to the disparities between the concrete particular and its representation in theory. According to Schwab, there is a fundamental incongruity of theory and practice. Within such a perspective, the particulars - or individuals - are never conceived as object of knowledge: they are only object of decisions or actions.

Schwab's point of view originates from a detailed analysis of the characteristics of a theory and the nature of educational problems. However, it must be said that his characterization of theories and of educational problems as such is not questioned. What could be questioned here is the assumption that there is a disparity between the two. As a matter of fact, in his series of articles devoted to the subject, Schwab examines on one side the theoretical and, on the other the practical, assuming an incongruity of the two. He does not investigate how the relationship between the two takes place in the actual development of science - as Pariente did in his book (Pariente's perspective will be elaborated in chapters 5, 6 and 7). Schwab does not examine, as Pariente did, how an actual discipline takes its individualities

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into account. In this sense, Schwab's view can be said to be based on a conceptual analysis which would have to be complemented with a careful analysis of the way science develops. In sum, Schwab's conception seems to be appropriate insofar as practical problems of the particulars have to be resolved. However, if some knowledge of the particulars is what is to be achieved, reference would have to be made to more appropriate views.

Chapter 3

THE NOMOTHETIC APPROACH

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In order to achieve a sound understanding of knowledge and therefore of the status given to individuality within the nomothetic approach in educational research, some links must be made with the philosophical roots of the movement, namely with the position of sociological empiricists (in general). Their position will be firstly examined and, secondly, the attitude of educational researchers working within the nomothetic approach will be compared to the sociological empiricist tradition. I shall then focus on problems related to the nature of knowledge achieved and the status given to individuality within such a research tradition in education.

Natural Sciences and the Sociological Empiricist Tradition

Auguste Comte is recognized as the originator of the idea of taking a scientific approach to the study of the social world. Due to a long tradition of success and intellectual achievement, the natural sciences (especially physics) are taken as standards that social sciences should aspire to: social or human phenomena should be studied according to the rules and models of this type of science. In addition, according to Emile Durkheim, the founding father of modern empirical sociology, individual ideas

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cannot be manifested through sensory observations, but collective ways of thinking can, mainly through standardized written forms (law codes, written creeds, etc.). In order to study scientifically social phenomena or actions, social researchers must reduce them to "things," that is, treat them like the objects of the physical sciences (Durkheim, [Sociological Method], c1895-1962,* pp. 27-28). In other words, as mental phenomena (intentions, beliefs, purposes, values, etc.) cannot be observed in themselves, only overt phenomena which correspond to them are open to empirical observations.

METHODS OF THE NATURAL SCIENCES

The methods of the natural sciences deal generally with things like planets, atoms, molecules, etc. As the natural sciences are based on the observation of the external world, so should be the social sciences: sociologists adopting these views can thus be appropriately called "sociological empiricists" (Lessnoff, [Social Science], 1974, p. 33). Indeed, influenced by the overwhelming success of the natural sciences, social scientists are generally willing to apply to the human sciences the methodology that has been successful in the natural sciences. No distinction is presupposed between the natures of the natural and the human

* The first date given, preceded by lowercase c, indicates the first date of the copyright, and the second one indicates the date of the edition used here.

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sciences. This explains why scholars sometimes designate this type of sociological research as a "naturalistic approach," whenever they want to emphasize such a characteristic.

ASSUMPTIONS

In adopting the procedures of the natural sciences, sociological empiricists also adhere, explicitly or implicitly, to the assumptions lying behind the natural sciences. For instance, sociological empiricists adhere to the assumption of uniformity of social life: their research framework is taken over from the natural sciences where uniformity of nature is a basic presupposition. They focus on events and practices that seem to remain stable over time and space, or on human behavior that seems consistent under similar circumstances. Sociological empiricists assume that what has been learned from past events can be generalized to future events. They assume that history repeats itself.

Another assumption that is taken over is the concept of causal relations: a mechanical cause involves relationships between matter and force in Newton's physics; a chemical cause "involves some energy transfer in combination between atoms of different elements"; a biological cause "is both mechanical and chemical." Analogically, with human phenomena behavior is assumed to be fairly consistent under similar circumstances and "one person's behavior toward another can be said to cause change in the state of another person" (Erickson, p. 126).

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Such a position is reinforced by a predilection for the unity of scientific method. Within such a perspective, the aim of the natural and social sciences is the same, namely, the discovery of universal laws. According to Karl R. Popper,

[there is] a really fundamental similarity between the natural and the social sciences. I have in mind the existence of sociological laws or hypotheses which are analogous to the laws or hypotheses of the natural sciences... There seems no reason why we should be unable to frame sociological theories which are important for all social periods. ([Historicism], 1957, pp. 62 and 101)

In the natural sciences, universal laws allow some prediction and control over natural phenomena; in the social sciences, universal laws would serve as a basis to make predictions and exert control over society.

UNIVERSAL AND PROBABILISTIC LAWS

However, it is important to note that in the natural sciences two different types of laws are used: universal laws - which lead to deductive-nomological explanations - and probabilistic laws - which lead to probabilistic explanations (Hempel, Philosophy of Natural Science, 1966). A universal law is formally expressed as follows: "All As are B" or "When A is the case, B is always the case." Therefore, laws required for a deductive-nomological explanation are statements of universal form, that is, asserting some uniform connection between empirical phenomena (Hempel,

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pp. 54-55). A probabilistic law can be formally expressed as follows: "Most As are B," or "When A is the case, B is usually the case," or "x% of all As are B."

The distinction between laws of universal form and laws of probabilistic form is not grounded on a difference in the strength of their empirical support, but is based on a different type of logic, namely, a deductive-nomological type of explanation on the one hand, and an inductive type on the other (Hempel, p. 66). In the deductive-nomological form of explanation, laws invoked are of universal form; in the probabilistic explanation, they are of probabilistic form. In the natural sciences, both types of laws are found. Therefore, a particular event can be given either a deductive-nomological explanation, or a probabilistic explanation, according to the type of law invoked, universal or probabilistic.

FORMS OF EXPLANATION

What is the case within the social sciences? It is a recognized fact that, in the present state of development of the social sciences, universal laws applicable to social phenomena are scarce. Universal social laws are practically non-existent: a few exceptions are some laws of economics referring to all societies (Lessnoff, p. 53). It seems that the deductive-nomological type of explanation within the social sciences

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(therefore within educational research) can be seen more as an ideal to be attained than a reality, at least for those who accept as valid this approach to explaining human affairs.

In general, only probabilistic forms of explanation are involved in the social sciences (Smith, [Research], 1983, p. 11). It seems that the best that can be done, in the present state of our knowledge (or, more appropriately: of our ignorance) in the domain of social or human phenomena, is to achieve the level of probabilistic explanations - at least according to the sociological empiricist viewpoint, which is challenged, as it will be seen further, by those who adhere to a rationalist position in the study of social phenomena.

However, whenever probabilistic laws are involved (in a probabilistic form of explanation), the knowledge of a particular object can become problematic, in both the natural and the social sciences. Indeed, the scientific knowledge of a particular object or individual is not necessarily achieved in every case because probabilistic laws, unlike universal laws, "do not imply firm predictions about particular cases," and "the prediction that a certain outcome is probable has only a limited validity" (Lessnoff, pp. 55-56). In other words, no prediction can be totally reliable: there is always a possibility that, in the case of a particular event, predictions based on averages do not occur. For example, reports Lessnoff, most trade unionists vote

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Labour in Britain. But it does not follow that if someone is a trade unionist he/she votes Labour. There are always some other factors which can affect the probability in a particular case: perhaps the father of the worker in question always voted Conservative, assuming that most people vote as their father voted (Lessnoff, p. 56).

To summarize thus far, according to sociological empiricists there is no important distinction between the natural sciences and the social sciences, and the latter are modelled on the former. They borrow from the natural sciences not only rules and methods, but also assumptions: they reduce their study of social phenomena or actions to observable "things," and believe in the principles of uniformity of social phenomena and of causal relations. However, even if they also adhere to the principle of the unity of scientific method, they usually only achieve probabilistic explanations involving probabilistic laws: universal laws are scarce and remain an ideal to be attained.

The Sociological Empiricist Tradition and the Nomothetic Approach in Educational Research

In educational literature, it is usually assumed that researchers working within the nomothetic approach totally adhere to the

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views - reported in the previous paragraphs - expressed by sociological empiricists. However, a careful examination of the process-product research tradition, which is recognized as the mainstream orientation (in the area of research on teaching) within the nomothetic approach, reveals that such an assumption is only partly true: whereas basic assumptions are imported as such from sociological empiricism, the procedures adopted are more or less deviant. Furthermore, problems involved with the nature of knowledge achieved within this type of educational approach is an issue which deserves to be discussed.

NATURAL SCIENCES AS A MODEL

According to Gage, no distinction is presupposed between the natures of the natural sciences and the social sciences. Favoring a naturalistic approach, Gage models his view of science mainly from the areas of medicine and agriculture (Gage, [Hard Gains], 1985, pp. 37-38). Modelling their views on the natural or physical sciences, educational researchers working within the nomothetic perspective reduce human phenomena to external "things," observable in actual classrooms.

Furthermore, uniformity of social phenomena is assumed and stability and durability of human phenomena is emphasized. The fact that the laws of the social sciences can be changed whereas those of the natural sciences cannot, is not seen as a serious difficulty. For instance, to the objection that variables in

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education can change over years, Gage replies that even if changes can affect the mean value of the variables involved, they "do not necessarily affect the correlations of those variables with other variables, such as outcomes" (p. 10). In addition, some mean values or relationships are not considered as equally changeable: while some may be changed easily, some others "are so enmeshed in a complex web of strong habits that they are changed only with great difficulty," for instance, the nonverbal behavior of teachers (p. 10). Making reference to the recent history of teaching by Larry Cuban (How Teachers Taught, 1984), Gage states that many educational phenomena have remained stable over time.

PRINCIPLE OF CAUSAL RELATIONS

Another assumption imported into educational research from the natural sciences is the principle of causal relations between different variables. However, in examining the foundations of the nomothetic approach, one is struck by the absence of any explicit theoretical framework. The type of framework used is actually of an empirical nature and consists more or less in a check-list of virtually all possible influences that could bear on teacher effectiveness. The empirical framework which models this research tradition has been set forth by H.E. Mitzel (in 1957) who distinguished four main classes of variables, each class including numerous specific variables.* The four categories (reported in Gage, p. 44) referred to are:

"presage": teacher characteristics such as age, sex, training, years of experience, etc.

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- "context": the setting, that is, grade level, subject matter, class size, etc.
- "process": teacher behavior, teaching method, teaching style, teaching practices, etc.
- "product": student achievement, attitudes, feelings, etc.

According to Gage, the scientific basis of the art of teaching - incidentally, one of his books is entitled: The Scientific Basis of the Art of Teaching (1978) - "consists of scientifically developed knowledge about the relationships between variables" (Gage, [Hard Gains], 1985, p. 7).

Such a "modest" conception of science, in focusing on "the scientific method" conceived essentially as a set of relationships between variables, denies the necessity of theory for scientific knowledge:

Notice that this conception of a scientific basis says nothing about theory, nomological networks, systems of postulates and axioms, or hypothetico-deductive relationships. This emphasis on relationships between variables does not deny the desirability of systematic theory; it merely means that, however desirable, systematic theory is not indispensable to any valid conception of science. (Gage, p. 7 - italics added)

- * Some refinement on this framework can be found principally in Dunkin and Biddle ([Teaching], 1974) and in Medley (Teacher Effectiveness, 1982) whose structure of teacher effectiveness encompasses nine types of variables, regrouped into two different related sets of variables.

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However, even if there is a clear absence of an explanatory theory within such a perspective, the outcome of the study of relationships between educational variables is of a general nature: "The knowledge obtained through scientific method is typically considered to be nomothetic, that is, more or less general across individuals" (p. 7). If relationships among variables were strong enough they would be considered as laws. It is in that sense that the process-product research tradition is said to aim at general or universal knowledge even if no such type of law has been discovered yet. Up to now, generalizations achieved are very weak: the relationships range between .2 and .5 (p. 11). According to Gage, the kind of results achieved in medicine also embody very weak relationships, but are still considered as very important and useful: analogically, in educational research, stresses Gage, "correlations or differences do not need to be large in order to be important" (p. 14).

STATISTICAL GENERALIZATIONS

Concretely, process-product studies are usually conducted in natural classrooms, where structured observations are made by means of categorial scales. At the level of analysis of data obtained from a variety of classroom observations, the observed processes are combined across all sampled classrooms: researchers combine their observations across days and across teachers observed. In other words, in their search for generalized laws, investigators are condemned to operate independently of place and

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time: knowledge is therefore "de-contextualized." Generalized knowledge can be obtained as far as features of particular classroom situations are neglected. Hence, generalization is inferred from the observation of specific or individual cases, whose particularities have to be ignored.

Effective teaching is identified through an act of synthesis by the researcher, in which the obtained teaching style is a composite associated with different desirable pupil performances (Gage, [Scientific Basis], 1978, p. 31). Such composites of teaching styles (obtained by application of a statistical technique called "meta-analysis") consist in statistical generalizations. These composites were recently translated into experimental studies in which some teachers were trained to use techniques which these earlier studies had shown, supposedly, to produce higher achievements. A group of teachers was trained in specific instructional procedures, such as "provide systematic feedback and corrections," "guide students during initial practice," "present new material in small steps, with students practice after each step," and so on (Rosenshine and Stevens, Teaching Functions, 1986, p. 377). These experiments are derived from previous correlational studies of teaching effectiveness. They are not derived, insists Gage, "from some ideology, a theory based on laboratory experiments, or some kind of philosophical reasoning" (Gage, [Hard Gains], 1985, p. 22). In sum, the process-product research tradition has moved gradually from a

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descriptive or observational stage to correlational studies, and is now performing some field experiments: it adheres to an "observational-correlational-experimental loop" (Gage, p. 37).

A NARROW INDUCTIVIST CONCEPTION OF SCIENTIFIC INQUIRY

A closer look at the nomothetic approach reveals that the methodology involved does not entirely conform to "the standard view" adopted by sociological empiricists in general. Indeed, Gage's conception of scientific knowledge corresponds in fact to what is called by Hempel a "narrow inductivist conception of scientific inquiry" (p. 11 - underlined by author). There is a great variety of opinion among contemporary philosophers of science but most agree at least on the fact that a narrow inductivist view of scientific inquiry, akin to Bacon's and Mill's canons of scientific method, is untenable. As Norwood R. Hanson pointed out three decades ago, every scientific observation is "theory-laden" (Patterns of Discovery, c1958-1961). For example, mentions Hanson, let us suppose for a moment that Johannas Kepler and Tycho Brahe stand on a hill, watching the dawn. According to Kepler, the sun is fixed, but according to Brahe (following Ptolemy and Aristotle's views), all celestial bodies move around the earth, which is fixed. Do both scientists see the same thing, asks Hanson? Obviously not, since Brahe sees the sun rising, and Kepler sees the earth moving (Hanson, p. 5). We can only find what we are prepared to find.

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From a naive realistic point of view, observation is a simple matter of opening one's eyes and looking: to describe objects is to represent them as they really are. However, as it is strongly claimed by most contemporary philosophers of science, selections of data are guided by theoretical presuppositions. Reality is complex, and objects have an infinite number of properties: this is precisely the role of theories to constrain observation by determining what to look for: "Only the kind of data to be sought is determined by theoretical expectation" (Ackerman, [Data], 1985, p. 32). What Abraham Kaplan designates more or less humorously as "the dogma of immaculate perception" is a very misleading philosophical position ([Methodology], 1985, p. 4296).

According to Hempel, a narrow inductivist conception distinguishes the following account of the four stages in scientific inquiry:

- (1) observation and recording of all facts,
 - (2) analysis and classification of these facts,
 - (3) inductive derivation of generalizations from them, and
 - (4) further testing of the generalizations.
- (Hempel, p. 11)

Within the nomothetic approach in educational research, the four steps involved in a narrow inductivist conception can easily be recognized. According to Gage, the first step comprises of the structured observation of classroom processes; furthermore, Gage adds, no claims can be made "about relationships between

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variables without creating classifications, or taxonomies, of our variables" (Gage, pp. 45 and 7). Then, some statistical generalization is obtained by a process of induction (Gage, p. 20).

The remaining part of Hempel's passage is crucial to establish a more solid link with Gage's views:

The first two of these stages are specifically assumed not to make use of any guesses or hypotheses as to how the observed facts might be interconnected; this restriction seems to have been imposed in the belief that such preconceived ideas would introduce a bias and would jeopardize the scientific objectivity of the investigation. (Hempel, p. 11)

According to Gage, "however desirable, systematic theory is not indispensable to any valid conception of science" (Gage, p. 7). A theory is not seen as a necessary ingredient for a scientific knowledge, but only as a goal to aspire to: "they [theories] do not set minimum requirements as to what we must have before we can lay claim to scientific knowledge" (Gage, p. 7).

OBSERVATION AND THEORY

As opposed to the narrow view, most contemporary philosophers of science believe that observation depends on theory:

The maxim that data should be gathered without guidance by antecedent hypotheses about the connections among the facts under study is self-defeating, and it is certainly not followed in scientific inquiry. On the contrary, tentative hypotheses are needed to give direction to a scientific investigation. Such hypotheses determine, among other things, what data should be collected at a given point in a scientific investigation. (Hempel, p. 13)

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Every observation presupposes some selection of the data. The second stage (classification of data) is open to the same type of criticism: classifications or taxonomies must be based on hypotheses about the type of connections between observed phenomena. Finally, criticism on the first two stages of inquiry "also undercut the notion that hypotheses are introduced only in the third stage, by inductive inference" (Hempel, p. 13).

Furthermore, not all statements of universal form can be considered as scientific laws. Indeed, in order to be qualified as laws, statements of universal form must be supported by scientific theories (Hempel, pp. 57-58). In this connection, meta-analysis is an inductive method of synthesis that allows for the unification of empirical findings which can be of a certain value but which do not generate new theoretical postulates: "such findings are not the basis for developing scientific laws in a theoretical sense" (Kavale and Forness, [Learning Disabilities], 1985, p. 14). Collections of data, whatever the degree of sophistication of statistical techniques employed, rarely provide new insights or theoretical developments.

In its present state, the nomothetic research tradition in education lies on a narrow conception of scientific investigation which, in fact, is not even followed in the actual practice within the natural sciences (that is supposedly the model to be aspired to).

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GENERAL KNOWLEDGE AND INDIVIDUALITIES

The explicit goal of the process-product research tradition is the improvement of educational practice. This explains why generalized knowledge - statistical generalization - achieved within the process-product research tradition (and its variants) usually takes the form of general recommendations, such as "begin a lesson with a short statement of goals," "guide students during initial practice," "provide systematic feedback and corrections," etc. (Rosenshine and Stevens, p. 377). Hence, it is understandable that researchers from alternative approaches raise questions about the usefulness of these prescriptions in particular circumstances, or concrete and local situations (Shulman, [Paradigms], 1986, p. 19).

How is it possible to derive from generalized outcomes some valid applications to specific educational situations? How can we derive particularization from generalization? How do we apply nomothetic knowledge to particular situations or idiographic cases? How are we going to build "an inferential bridge" between the specific group studied and other groups concerning whom we wish to generalize (Shulman, [Disciplines], 1981, p. 9)?

Acknowledging the difficulty, Gage replies that the solution lies at the level of the individual teacher. Application of nomothetic knowledge is not peculiar to education; it regularly occurs in many crafts and technological arts:

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The problem to which the nomothetic knowledge is applied is always idiographic: a particular individual case comprising a unique combination of the levels of many other relevant variables (Gage, p. 8).

However, such an application requires some "instrumental or practical art." By "art" Gage makes reference to a tremendously complex process of interaction between many variables, which cannot be reduced to recipes, algorithms or formulas. For instance, the bridge designer must use art in applying nomothetic knowledge to a unique situation. So does the physician with a diabetic patient. Similarly, the teacher must use art in applying nomothetic knowledge to a specific classroom, in a specific socio-economic milieu, with specific students, for a specific subject matter, etc.

At the level of application of nomothetic knowledge, claims Gage, it is left to the practitioner to take into account particularities of the situation in which he/she is involved. However, how would a teacher find out which ones among all the variables correlated are effectively present or combined in his/her own setting? Nothing is given to the practitioner to appreciate the degree of deviancy of individual students from averages. No "boundary conditions" are given. The problem grows out of proportion when one realizes, as seen previously, that "myriads of variables" are studied by investigators and "hundreds of correlations" are synthesized (Gage, p. 31).

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In sum, the process-product research tradition and its derivatives have imported basic assumptions from sociological empiricism (hence, from the natural or physical sciences): no fundamental distinction is presupposed between the natural and social sciences. Human phenomena investigated are then reduced to observable "things" in actual classrooms. Furthermore, uniformity of social phenomena is assumed, and change over time is seen as affecting only the mean value of the variables studied: their correlations are believed to be stable. In addition, the principle of causal relations between variables is adopted but the view of science does not stress importance of theory. Instead, a check-list of all possible educational influences is proposed as a guide for investigation: science is conceived as a set of relationships between variables, whose correlations identified, up to now, are in fact very weak. In addition, due to the absence of any theoretical framework, a narrow inductivist conception of scientific inquiry is adopted.

It seems that the "modest" conception of science underlying the nomothetic approach in educational research is defective, particularly because of its refusal to recognize the importance of a conceptual or theoretical framework, which is necessary to determine at the outset the data to be collected, and to give them sense in the way they are organized and interpreted. Furthermore, such a view of science leads to a limited type of

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generalization, namely statistical generalization, and aims at improving practice without allowing interested practitioners to identify particular variables involved in their own situation. The application to idiographic cases of nomothetic knowledge achieved is entirely left to the art of practitioners. No explicit logical procedure is furnished, which would allow to base particularization on generalization. However, in spite of these theoretical weaknesses, insofar as the goal of research is to contribute some general knowledge, nomothetic approach in education seems appropriate. However, such an approach is totally inappropriate whenever someone aims at achieving some genuine knowledge of individualities.

Chapter 4

THE IDIOGRAPHIC APPROACH

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As mentioned in the first chapter, the nomothetic and idiographic traditions in educational research can be linked to empiricism on the one hand, and to rationalism on the other. Here again, in order to achieve a better understanding of the conception of knowledge (and therefore of the status given to individuality) adopted by interpretive researchers in the study of education, some links must be made with their philosophical roots, namely with the position of sociological rationalists. Such a position will be firstly examined and, secondly, the attitude of educational researchers working within the idiographic approach will be compared to the sociological rationalist tradition.

Natural Sciences and the Sociological Rationalist Tradition

Soon after the sociological empiricist movement expressed the idea of modelling the study of social phenomena on the natural sciences, a countermovement began in Germany, mainly with Wilhelm Dilthey, Heinrich Rickert, and Max Weber, whose philosophical origins can be linked to a Kantian tradition (Smith, [Research], 1983, p. 6).

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SPECIFICITY OF CULTURAL STUDIES

The argumentation against making reference to the model of the natural sciences in the study of human phenomena is threefold: "cultural studies" or "moral sciences"* do not deal with the same type of subject matter, should be assigned a different goal, and imply different values.

Subject matter

According to Dilthey, the subject matter is different because the social sciences do not study physical observable bodies, but the products of the human mind, that is, of values, intentions, purposes, emotions, beliefs, moral principles, etc. Inanimate objects exist outside us, but the social sciences focus on human action, which has a mental aspect. It follows that the investigator cannot be separated from what is investigated: there is no objective social reality as such divorced from the investigator who participates in and interprets that reality (Smith and Heshusius, [Debate], 1986, p. 5). What is being investigated is affected by the process of investigation itself. Accordingly, Dilthey distinguishes between sensory-experience, pertaining to the natural sciences, and inner-lived experiences, pertaining to the cultural studies:

* In the language of our day, "cultural sciences," "cultural studies," or "moral sciences" are usually designated as "social sciences" (and less frequently as "human sciences").

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We explain nature, but we understand mental life... This means that the methods of studying mental life, history and society differ greatly from those used to acquire knowledge of nature... (Dilthey, in Rickman, [Dilthey], 1976, p. 89 - quoted in Phillips, [Confoundings], forthcoming)

Goal

Furthermore, argues Dilthey, the social world is extremely complex, it changes over time, and cultures are different. As Popper - who disagrees with such a view - puts it,

historicism [sociological rationalism] insists that this principle [in similar circumstances similar things will happen] is necessarily useless in sociology. Similar circumstances only arise within a single historical period. They never persist from one period to another. Hence there is no long-run uniformity in society on which long-term generalizations could be based... (Popper, [Historicism], 1957, p. 6)

Accordingly, the goal of the social sciences should not be to discover laws as in the natural sciences. They should concentrate on verstehen, that is, on "interpretive understanding" of the meaning others give to their own situations (Smith, [Research], p. 12). Methodologically, such a view means that in order to achieve a real understanding of the experience of the other, the researcher must put himself/herself in the place of the other: "This process of verstehen involve[s] the need to 'live through,' or recreate, the experience of others within oneself" (p. 7).

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At least two levels of understanding can therefore be distinguished. At the first level, a direct understanding can be reached with the immediate description of human actions: such is the perception of the "what" of an activity. At another level, the researcher aims at understanding the "why" of the activity, that is, "the nature of the activity and the meaning that the actor assigns to his or her own actions" (p. 12). A hermeneutical approach is proposed for the understanding of the "why".

However, the meaning of an action is never simple: meaning is a very complex phenomenon, because it is always embedded in a context. Thus an understanding of the meaning of a human activity requires an understanding of the context in which such a meaning occurs. Meaning is socially, culturally and historically bounded: a meaningful interpretation is a process of constant movement between parts and a whole (p. 12).

Values

Finally, a third argument against the imitation of the methods of the natural sciences by the social scientist concerns the values involved. The physical sciences, claims Rickert, select their object according to the features they have in common with abstraction or generalization; the social sciences choose their object for study according to the values of the subjects under investigation and to those of the researchers. This means that interests, values, and dispositions shape our view of the world,

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and our knowledge of it, that is, the way we study reality and discuss about it. Within such a perspective, objectivity is therefore synonymous with "social agreement," and facts and values are not conceived as two separate entities as it was the case with sociological empiricism. Social research is considered as meaningful only to the extent that it has a value base (p. 11).

The three previous arguments invoked (subject matter, goal, and values) in favor of devising a different methodology for the social sciences do not have an equal weight for all sociological rationalists. For example, whereas Weber, like Dilthey, assigns verstehen as the particular goal of the social sciences, contrary to many rationalists he does not agree with Dilthey on the difference related to the subject matter (Smith and Heshusius, p. 5). Furthermore, he allows that hypotheses be checked empirically without implying the achievement of causal laws, but rather the achievement of laws applicable to only limited contexts (Smith, p. 8). This is what makes scholars believe that Weber actually attempted to synthesize the empiricist and the rationalist perspectives. However, according to Smith and Heshusius this attempt to bring together the two perspectives was a failure and left open the two perspectives, which are still in competition.

A few decades ago, the American sociologist George A. Lundberg adhered to both positions: "'Will,' 'feeling,' 'ends,' 'motives,'

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'values,' etc... are the phlogiston of the social sciences" (Lundberg, [Postulates], c1939-1963, p. 44). Therefore, adds Lundberg, these concepts should be replaced by purely physical concepts: as people's feelings, thoughts, intentions, etc. are expressed in language, linguistic symbols should be empirically studied.

In 1974, in his book entitled The Structure of Social Science, Michael H. Lessnoff endorsed the "rationalist" position, arguing that the unity of human action is not its physical aspects but "the purposive aspect of behaviour," that is, human action with intentions, purposes, desires, etc., which are irreducible to physical facts (pp. 32-48). These characteristics of social phenomena require, claims Lessnoff, an approach which should be different from that suggested by the model of the natural sciences (p. 32).

In sum, as empiricism was traditionally challenged by idealism in philosophy - and vice versa - the sociological empiricist movement in the study of human phenomena, which was linked to the nomothetic approach in educational research, was challenged by the sociological rationalist movement, which can be linked to the idiographic approach in educational research. The sociological rationalist tradition can be characterized by its rejection of the natural sciences as the model of scientificity: subject matter, goal, and values involved in the study of social and/or

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human phenomena are considered as different from the natural sciences, because the object of study is the product of human minds (or inner-lived experiences) rather than physical observable objects. As telic properties of human behavior are taken into consideration, the goal of the social sciences is not to discover universal laws but to understand the meaning of human actions, at two complementary levels: the "what" of the activities, and the "why" (which can lead to hermeneutics). As the meaning of actions is seen as embedded in a larger context, interpretive understanding must take into consideration the context of meaningful actions. As the investigator cannot be separated from what is being investigated, interests, values, and dispositions of the researcher are not considered as separated from the values investigated. Finally, as objectivity is equated with social agreement, facts and values are not two separate entities, as it was the case with sociological empiricists.

The Sociological Rationalist Tradition and the Idiographic Approach in Educational Research

The sociological rationalist movement has a long tradition - about seventy years - within the social sciences, particularly sociology and anthropology. However, it is only in the past decade that such a perspective emerged in the field of education.

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As the most influential trend in the area of teaching which espoused sociological rationalist views is the one advocated by Erickson - participant observational research - his conception will be presented and linked with the sociological rationalist tradition. As was the case with the nomothetic tradition, a whole family of variant research programs can be observed within the idiographic approach. Again, problems related to the type of knowledge involved will be emphasized.

GOAL OF SCIENTIFIC INQUIRY

According to Erickson, there is a fundamental distinction between the nature of the natural sciences (Naturwissenschaften) and of the human sciences (Geisteswissenschaften). Educational research deals with human beings, more specifically with social actions. Furthermore, the goal of scientific inquiry is not to discover laws but to concentrate on verstehen, that is, on interpretive understanding of the meaning of actions. Indeed, in participant observational fieldwork, the focus is on "the immediate and local meanings of actions, as defined from the actors' point of view" (Erickson, p. 119 - underlined by author). Research questions that interest social researchers working within this orientation mainly concern what is happening specifically in a particular setting, what the actions that take place mean to the actors involved, what patterns of social organization and cultural principles are present, how the specific happenings as a whole are related to happenings at other system levels, etc. (p. 121).

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These types of research questions clearly show that researchers are more interested in the specific rather than the general, that is, in the activities happening in a particular place rather than across many places: "For interpretive researchers... the production of generalizable knowledge seems inappropriate" (p. 130).

The focus on the particular - on "the practical" in Schwab's terminology - is seen by interpretive researchers as consistent with some recent American survey data showing large differences across individuals as far as school achievement, measured intelligence, class, race, gender and language backgrounds are concerned. Surface similarities among individuals are considered as masking underlying diversity. As human actions are grounded in choices of meaning interpretation, actions are always changing and must continually be reinterpreted. Each individual is perceived as being unique, and the heart of the matter is "sense-making" in specific situations. The idiographic approach can then be considered as a proposition or a process that makes reference to specific problems, in a specific milieu, with specific persons, etc., which are characterized by their eventual changing nature.

MEANING-PERSPECTIVE

In the educational field, this research method attempts to interpret the meaning-perspectives of specific teachers in their

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specific environment, that is, looking for the distinctive local meanings of what is happening in a particular classroom. Criteria of effective teaching are not seen as lying outside the particular classroom setting analyzed by means of achievement tests for example. They are rather seen as lying within the situation itself, by such means as "equality of opportunities to participate," "clear communications of meaning," "smoothness of interchanges," etc. (Shulman, [Paradigms], 1986, p. 19). In other words,

effective teaching is seen as occurring in the particular and concrete circumstances of the practice of a specific teacher with a specific set of students "this year," "this day," and "this moment" (just after a fire drill). (Erickson, p. 130)

Within the approach, the meanings-in-action of a particular set of individuals are local in two senses. Firstly, they are local in that each classroom is conceived as a sort of microculture which differs from other classrooms, whatever their apparent degree of similarities. Secondly, they are local in the sense that every present situation or activity is considered as different from a similar situation or activity that occurred the day before or that will occur the day after. The accent is clearly put on variation across classrooms.

However, meanings-in-action are nonlocal culturally and socially. Indeed, according to Erickson the approach does not imply the neglect of comparative studies between different social settings on the one hand, and beyond the immediate circumstances of the

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local setting on the other hand. In the first case, Erickson emphasizes the necessity of examining the possible relationships between a local setting and its wider social and cultural context. However, such a procedure of contextualization is not seen as an attempt to generalize across individuals and situations. The need for comparison of different social settings comes from the fact that contextual circumstances could help "to clarify what is happening in the local setting itself" (p. 122). A particular classroom context is considered as nested within other larger contexts. For instance, the observation that teachers don't ask for extra materials could be interpreted differently if it is done in a classroom that is part of a large school system in which ordering of supplementary materials is very difficult at the level of a particular school district. In the second case, the need for comparison beyond the local setting is again considered not as a way of generalizing but as a means toward a better understanding of the local setting (p. 122).

STATUS OF GENERALIZATIONS

At this point, it should be noted that even if the emphasis is on the particular, in Erickson's conception generalizations are not totally absent within the interpretive approach. However, patterns of generalization that are looked for are "within the case at hand" rather than "from one case or setting to another" as it was the case with the nomothetic approach (p. 148). In

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order to generate and test assertions, the researcher looks for "key linkages" among sets of data:

A key linkage is key in that it is of central significance for the major assertions the researcher wants to make. The key linkage is linking in that it connects up many items of data as analogous instances of the same phenomenon. (Erickson, pp. 147-148)

For instance, in order to assert that a teacher distinguishes between good and bad readers, a researcher must make links between observed occurrences, within the corpus, in which bad readers and good readers were treated differently by the teacher. General assertions occur at different levels: a set of field notes, interview comments and site documents (memos, posters, etc.) are linked into subassertions; another set is linked into other subassertions, and so on. In turn, the sets of subassertions are linked into general assertions. Key linkage is conceived by Erickson as a process of "analytic induction" (p. 149).

Paradoxically, interpretive researchers not only attempt at characterizing particular settings but also at discovering universals as well. However, universals looked for are not "abstract" universals obtained through statistical generalization as it is the case within the nomothetic approach, but concrete universals "arrived at by studying a specific case in great detail and then comparing it with other cases studied in equally great detail" (p. 130). Three different levels are distinguished: some aspects of a particular instance of a teacher teaching can be generalized to other teaching situations; other

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aspects, less general, are "specific" to the circumstances of that type of situation; still other aspects are "unique" to the particular event and to the particular persons involved. Given such assumptions, the task of the analyst is then

to uncover the different layers of universality and particularity that are confronted in the specific case at hand - what is broadly universal, what generalizes to other similar situations, what is unique to the given instance. This can only be done... by attending to the details of the concrete case at hand. Thus the primary concern of interpretive research is particularizability, rather than generalizability. (Erickson, p. 130 - italics added)

The existence of universal properties is not denied. They are presumed to be manifested in the concrete, not in the abstract: "the paradox is that to achieve valid discovery of universals one must stay very close to concrete cases" (p. 130).

LOGICAL GENERALIZATIONS

At the level of application of research findings, it is a matter of what Erickson calls "logical generalization." Logical generalization is not the responsibility of the researcher but of the reader of the research report, who must examine the circumstances of the case to determine the ways in which the case fits his/her own situation (p. 153). Generalization is made not by the author but by the consumer of the research. It is the main reason why the researcher is asked to describe "clearly and specifically" the circumstances of the case investigated, in order to allow practitioners to decide whether their own situation corresponds

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to the situation described in the research report. The implication of such a view is that generalization is like thinking or reasoning by analogy, but generalization through analogy is in fact a very modest claim for generalizability (Wehlage, [Purpose of Generalization], 1981, p. 215).

What is the usefulness of the findings? Practitioners, Erickson stresses, are interested in the generalizability of the research findings; however, as seen previously, it is a matter of logical generalization. In some passages, Erickson makes clear reference to the usefulness of research results (under the form of "prescriptions") for practitioners. However, there could be some confusion about the nature of generalization achieved: as Cronbach pointed out, "when we give proper weight to local conditions, any generalization is a working hypothesis, not a conclusion" ([Two Disciplines], 1975, p. 125).

Furthermore, Erickson seems to give more or less importance - only a "technical" one - to the general scientific community (fellow researchers) as audience (Erickson, p. 130). According to Erickson, "the interest in learning by positive and negative example from a case study presupposes that the case is in some ways comparable to one's own situation" (p. 153). However, it seems appropriate to ask how a practitioner is going to know that the case study in question is comparable to his/her own situation, without doing the same type of research upon his/her own

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situation? How can we legitimately compare two particular situations, if only one case study has been described in detail? As mentioned by Wehlage, "generalization by analogy can occur once one recognizes that an analogous situation has been encountered" and this can be a problem since "it is not always clear what is to count as an analogous situation" (p. 214).

A reliable comparison would require that both situations be described in comparable terms and with the same depth. By analogy, how would a linguist compare the phonological systems of two different languages - English and French, for example - if he/she only had at his/her disposal a full description of one phonological system - of English but not of the French language? It seems that in order to be more reliable, Erickson's methodology should integrate the detailed analysis of the particular situation of eventual users of research findings. Otherwise, the comparison between the case study analyzed and the specific situation of the practitioner will have to rest on the intuition of the practitioner. Whatever the case may be, it can be said that there is some ambivalence concerning the desire to provide adequate guidance to teachers - a practical purpose - and the desire to achieve a better understanding of a particular classroom situation - a theoretical purpose.

Previous paragraphs reveal that in spite of its general interest, Erickson's attitude toward educational research is effectively

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vague and confused on central questions. Indeed, within the idiographic approach as understood and explained by Erickson, the more immediate goal of research consists in "understanding" from an insider perspective the nature of teaching-learning processes. Erickson makes numerous references to the importance of aiming at "discovering and communicating the meaning-perspectives of the people studied," or to the nature of research questions from an interpretive point of view. However, the position of interpretive researchers is not always as clear as one would expect it to be. Even if many passages in this type of educational literature make reference to "understanding" what is occurring in particular and concrete circumstances as the primary goal of inquiry, a careful examination reveals two fundamental ambiguities on this important issue.

As it was explained earlier, there is a first type of ambiguity between the desire to achieve concurrently some practical purpose and some theoretical purpose. There is also a second ambiguity lying in these passages where Erickson assigns to interpretive researchers the task of discovering universals:

This is not to say that interpretive research is not interested in the discovery of universals, but that it takes a different route to their discovery, given the assumptions about the state of nature in social life that interpretive researchers make. (Erickson, p. 130)

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Even if he insists on the fact that universals looked for are not abstract but concrete universals arrived at by studying particular cases in great detail, it is unclear if the ultimate goal of research can remain "understanding." For instance, how can the meaning-perspective of the participants involved still be taken into consideration at the level of what is broadly universal, or even at the level of what can be generalized to other similar situations? How is it possible for interpretive researchers, without sacrificing the meaning-perspective of participants, to reconcile their primary concern for "particularizability" with their task to discover universals - even "concrete" ones - or generalized phenomena?

By way of summary, it can be said that Erickson's view coincides with Schwab's view concerning the source of all educational problems: they must be derived from the study of particular classrooms, particular situations, particular students and/or teachers, etc. The "particular" (in Erickson's terminology) corresponds more or less to the "practical" (in Schwab's terminology). However, whereas the goal of "the practical" (according to Schwab's view) is to generate some decisions about actions in concrete situations, the goal of "the particular" (according to Erickson's view) is to achieve some interpretive understanding of the meaning of human actions. Meanings-in-action are at the same time local (in two senses) and nonlocal (that is, culturally and

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socially embedded). Paradoxically, interpretive researchers, in Erickson's view, not only look for "key linkages" within a particular setting, but also for concrete universals as well.

At the level of application, some intuitive generalization by analogy is left to the practitioner or consumer of research - a solution which is more or less analogous to the one advocated by Gage (a recourse to the "instrumental art" of the teacher). Finally, two fundamental ambiguities have been identified: one between the practical and the theoretical purpose of the research, and the other between the task of understanding the meaning-perspective of participants in a particular situation and the task of discovering concrete universals. Insofar as individuality is concerned, the idiographic approach is therefore appropriate only if and when some UNDERSTANDING of the individual is the goal to be achieved. Here again, KNOWLEDGE of the individual qua individual is overlooked.

Chapter 5

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Up to now, it has been shown that the three broad tendencies involved in both areas of curriculum studies and the study of teaching, either focus on different aspects of individuality or neglect it. While the practical approach uses theory as a basis for action on the particulars, the nomothetic approach, aiming at discovering regularities or universal tendencies, overlooks individualities, and the idiographic approach emphasizes the understanding of meanings-in-action of individualities to the detriment of achieving some scientific knowledge of individuals. Such are the main tendencies that are currently observed in the study of education. It results that none of these approaches seems satisfactory insofar as knowledge of individualities is concerned.

However, as mentioned in the first chapter, some social sciences (including the study of education) deal with this complex issue, that is, aim at achieving some knowledge of individuals. Under the circumstances, in this chapter I shall firstly attempt to show that two types of knowledge, by system and by model, are involved in the utilization of a practical instrument in psychology: the Rorschach test. The idea is to illustrate how

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the same tool can be applied to two different domains, according to different purposes in view: the identification of schizophrenics and, among non-patient subjects, the reconstitution of a whole personality. Two types of processes are involved in these usages, which will be explained in detail. For convenience of presentation, the characteristics of the other type of knowledge - knowledge by model - will only be given in the next two chapters.

Then, Roman Jakobson's theory of phonological features will be presented in order to illustrate how one type of knowledge - knowledge by system - can be applied within a discipline usually recognized as scientific. I shall emphasize the fact that, in the utilization of this type of knowledge, a discovery process is involved: once a grid is established the task is to discover how a particular combination of features fits into this predetermined grid.

In the remaining part of the chapter, I shall illustrate how such a type of knowledge is also used in the study of education, more precisely, in the area of second language teaching. An observation instrument - the COLT scheme (Communicative Orientation of Language Teaching) - has been specifically designed by Maria Fröhlich, Nina Spada, and Patrick Allen (1985) to capture differences in the communicative orientation of second language (L2) classroom interaction in a variety of settings.

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The Rorschach Test

In 1921, the Swiss psychiatrist Hermann Rorschach published a monograph, Psychodiagnostik, containing his famous 10 symmetrical inkblots (actually derived from a popular game of his time known as "the Blotto game"). In the 1940s and 1950s, the test was still used in clinical psychology as a tool for the assessment or psychodiagnosis of individuals, mainly as a means of diagnostic for the differentiation of schizophrenia. During the 1960s and 1970s, the role of the clinician broadened, and a new utilization of the test was explored by a few investigators. The domain of application of the test was gradually diversified and the Rorschach soon became the most commonly used instrument for the assessment of personality structure of non-patients subjects (Exner, [The Rorschach], 1986, p. 3).

It is interesting to note that Rorschach himself foresaw the possibility of utilizing his test for two different purposes. Indeed, on the one hand, he realized the diagnostic usefulness of his test in the identification of the schizophrenic; on the other hand, he discovered that some clusters of high frequency responses among non-patient individuals, mainly movement or color responses, seemed to be related to distinctive personality traits (Exner, p. 5).

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The actual form of the Rorschach test generally used in the United States is the Comprehensive System published in 1974 by the Rorschach Research Foundation, which still uses the same 10 original inkblots. The test is comprised of four major units: the Structural Summary, the Sequence of Scores, the Associations, and the Inquiry. Structural Summary, which contains more than 100 variables, includes frequencies, ratios, and percentages of the codes. The Sequence of Scores provides information gathered from the order in which the answers occur: for instance, while some persons always use the whole blot for their first response to each blot, some others may frequently refer to some uncommon detail area. Free Associations and Inquiry include verbalizations from the subjects. A Special Scores section was recently added (1986) to the test to quantify many unusual characteristics in the responses (like "A butterfly with his hands out") that were qualitatively interpreted in the past (Exner, p. 161).

From an epistemological perspective, the Rorschach poses very important issues: What type of knowledge is achieved? How is knowledge achieved? What are the intellectual operations involved? and so on. In the present study, the main epistemological interest of the Rorschach test comes from the fact that it can convincingly be used to illustrate two different ways of achieving knowledge (Pariente, pp. 180-182). Indeed, whereas the clinical use of the method leads to a classification of pathological cases in predetermined categories, its vocational

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application leads to the assessment of a whole personality structure, different for each individual. Such is the issue - the two types of knowledge involved in the Rorschach test - that must be examined.*

CLASSIFICATION OF INDIVIDUALS

In the clinical use of the Rorschach, seen as a method well suited in identifying the schizophrenic (e.g., in the army), a system of classes is predetermined and the problem of the clinician is therefore to discover of which class or classes the subject is an element. For instance, even if many psychiatric groups have inadequate controls (such as impulsive styles, borderline personalities, etc.) or tend to be inept in social relationships (as it is the case with schizoids, immature personalities, etc.), it remains that no group, other than schizophrenia, suffers from both inaccurate perception and disordered thinking (Exner, p. 418). In the Comprehensive System, a few variables - some of which are included in the Critical Special Scores - are related to possible perceptual distortions and to different forms of incoherent or disordered thought. Empirical research and testing shows that four specific variables "could be

* As Pariente's book has been published in 1973, information concerning the Rorschach test seems more or less accurate or oversimplified. In the present study, reference has been made to more recent available information (mainly to Exner's book, 1986).

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used as the nucleus of a cluster that might have considerable utility for screening structural data for the possible presence of schizophrenia" (Exner, p. 421).

In other words, neither perceptual inaccuracy alone, nor disordered thinking alone indicates schizophrenia. Schizophrenia can be manifested through the use of the Rorschach as long as a certain configuration of (computerized) variables, mainly addressing inaccurate perception and disordered thinking, can be diagnosed. When such a cluster of variables is identified in the "Schizophrenia Index" (SCZI), the possibility of schizophrenia being present is considered substantial.

From an epistemological perspective, such a procedure can be seen as a means of classification: a person can be diagnosed as schizophrenic if the presence of some specific variables is discovered among the features of his or her personality. Indeed, the cluster of necessary and sufficient variables for screening eventual psychopathological cases such as schizophrenics are predetermined variables. Individuals are classified by being assigned to a predetermined category consisting in a configuration of variables. An identical diagnosis is applied to a group of different subjects. As identifying what makes them different from each other is not a goal to be achieved, particular features of specific subjects are ignored. Schizophrenics become members

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of the class of schizophrenics, whatever their other particularities might be. This type of knowledge is called by Pariente: knowledge by system.

RECONSTITUTION OF A PERSONALITY

As mentioned earlier, the Rorschach test can be used not only as a means of detecting schizophrenics, but also as a tool for the reconstitution of a whole personality among non-patient or intact personalities. It seems that every subject is influenced by personal characteristics or features in the decisions concerning which responses to deliver when the Rorschach test is given. Based upon this premise, some important information can be gathered from the test, concerning personal habits, traits, or styles.

Rorschach interpretation is actually described as a two-stage procedure, "the propositional stage," and "the integration stage." During the first phase, propositions or hypotheses are formulated by reviewing each of the four major units of the data. For example, a subject can have given a below average number of responses, has no color responses, has a proportionally high frequency of "popular" responses, and nevertheless most of the responses are of good quality. The composites of these features can lead to one or two hypotheses: the possibility of constriction and/or defensiveness, or the capacity and/or willingness to

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approach the blots in a conventional manner. From these propositions, numerous questions and additional hypotheses can be generated, which cannot be answered from the bits of data examined (Exner, pp. 300-301).

A meaningful description of the subject must be created: this is the integration stage. It involves the clinical conceptualization of the psychology, that is, a good knowledge of personality and behavioral theories, and some expertise in psychopathology. The "projective process" contributes to translate Rorschach scores and words (that is, verbalizations given during the Free Association, and the Inquiry) into some meaningful understanding of a subject. Some previously formulated propositions may be rejected, modified or clarified: "clinicians go beyond specific data, using their propositional statements as a base and adding to that base their own deductive logic and knowledge of human behavior and psychopathology" (Exner, p. 302). For example, a Rorschach description can show that a subject is "quick" to display emotion under stressful conditions. Such an information provides only a limited understanding of the person. Some clarification is necessary to show whether this inclination is used adaptively, or whether it is a liability. But this added behavioral information, which aims at clarifying how the emotion is displayed, cannot be based upon information drawn exclusively from the test: it is an output of the Rorschach clinician.

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In order to achieve some understanding of a specific person, the clinician must therefore go beyond the level of simple classification given by the test:

there is no simple checklist of Rorschach signs that automatically can be translated as representative of aspects of personality or behavior (...). That supposition is pure non-sense (Exner, p. 306 - underlined by author).

The understanding of a subject cannot be based upon a "cookbook approach" to diagnostics. The reconstitution of a personality is too complex for a simplistic checklist approach: it would be a "naive assumption" to believe that "a checklist of signs can be translated directly into information regarding features of personality or behaviors" (Exner, p. 307). In other words, once numerous propositions have been formulated by examining each of the four units of the test, "a logical integration" of the postulates must be formed. And such a process involves a clinical conceptualization of the psychology of a person.

At this point, it must be mentioned that before going from the Structural data to the Sequence of Scores in order to generate more hypotheses, in most records the picture of the personality begins to form quickly (Exner, p. 308). Indeed, in the Comprehensive System, a Table was constructed (from 7500 protocols including 162,427 responses), which comprises a listing of 27 common or popular content categories of responses. By clustering these variables, it seems possible to relate them to issues such as stress tolerance, capacity for control, the use of affect,

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etc. In comparing the content of the responses of the subject under investigation with the common list of content categories, "usually the portrait is extensive before the Sequence or verbal material are considered. Most of it is based on nomothetic considerations" (Exner, p. 308). In many cases, then, the singularity of a person consists in a set of common features to which other particular features are added, by reviewing the other major components of the test. In these cases, the projective features can be said to add "flesh" to the nomothetic skeleton (Exner, p. 299).

However, it would be erroneous to conclude that information given by the Structural data is always of a general or common nature: it happens that the particular mixture of features that can be discovered in this component of the test can already give some clues concerning the singularity of the subject: "the Structural data will often provide much idiographic information because of the mixture of features that is discovered" (Exner, p. 308). In other words, in some cases the singularity of a personality will start to emerge right from the examination of the Structural data. This implies that even among non-patient personalities the singularity of some subjects consists in entirely particular clusters of features, with no common or popular set of features as it very often is the case.

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TWO TYPES OF PROCESSES

As mentioned previously, in the use of the Rorschach method for the identification of schizophrenics, an identical diagnosis is given to all schizophrenic subjects. They are all grouped under the same class, the class of schizophrenics. In the process of classification, the differences among schizophrenic subjects is ignored: the only relevant features are the features common to the subjects.

When the Rorschach test is used as a means of reconstruction of a personality, the interpreter must go beyond the level of classification. It must be recognized that at a certain stage, frequently a subject can be considered as a simple element of a class, for instance, the class of people showing a strong tendency to use the inner life for gratification. However, as such information would only lead to a very limited understanding of a person, some additional information is necessary to achieve a rich understanding of a person in its singularity. The assessment of a personality implies the identification of features, given in the test and based upon the knowledge of the interpreter, that are particular to a subject. In most cases, once some features of a subject have been related to the 27 common content categories, there remains to identify, with many additional specific features, to what extent this subject is particular, that is, different from all the others. In other cases, the personality is composed of an entirely particular

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mixture of features. In both cases, the dynamics of a personality cannot be achieved by means of predetermined categories of variables (as it is the case with the identification of schizophrenics). This type of knowledge is called by Pariente: knowledge by model (which will be characterized with more details in the next chapter).

As stressed by Pariente, two different processes are involved in the use of the Rorschach test: on the one hand, a system of classes is given a priori and, on the other hand, a class or the product of classes a subject belongs to must be constructed. In the first case, a certain knowledge of a personality is achieved, but a subject is not known in its singularity. In the second case, a less limited knowledge of a person is achieved: the subject is apprehended in its singularity, in its individuality qua individuality (Pariente, pp. 181-2). It must be noted that with both procedures, a classification is achieved: while in the first case an individual is classified as a member of an a priori class, in the second case a person is considered as a member of a constructed class. The identification of meaningful features leading to a knowledge of the singularity of a subject must be added to the previous information available. The Rorschach test can lead to both nomothetic comparisons between subjects and idiographic knowledge of a person, that is, to both knowledge by system and knowledge by model.

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In the following pages, I would like to demonstrate, following Pariente's suggestion, that these two types of processes (by system and by model) are involved in current scientific practice. In order to illustrate this viewpoint, I shall concentrate on the case of linguistics, assuming that such a discipline convincingly exemplifies both types of knowledge (the second type will be presented in the following chapter). In his book, Pariente deals extensively with psychoanalysis, and to a certain extent with mythology, clinical medicine, geography and history, but only sporadically with linguistics. The actual attempt to apply systematically Pariente's view to phonology can also be considered as an empirical test for his theory of individuality.

Jakobson's Phonological Features

One of the best examples of knowledge by system in the area of linguistics seems to be Jakobson's theory of phonological features. Indeed, in 1951, in collaboration with C. G. M. Fant and Morris Halle, Jakobson suggests a new approach to phonological analysis (in Preliminaries to Speech Analysis).^{*} The new

* In spite of the three names appearing on the cover, it is usually recognized that most of the original ideas discussed throughout the book originated from Jakobson, probably because of his 1941 monograph on child language, aphasia, and phonological universals. This explains why many authors make only reference to "the Jakobsonian distinctive features."

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proposal departs from traditional classifications in at least four complementary aspects (Peter Hawkins, Introducing Phonology, 1984, p. 77).

JAKOBSON'S CLASSIFICATION

Firstly, phonemes are regarded as composed of features, and all phonological features are considered binary: each feature is given either the value "+" or the value "-". For instance, instead of having two separate labels such as "voiced" and "voiceless", only a single feature, [voiced], can be set up: voiced sounds are specified as [+ voiced] and voiceless ones as [- voiced]. Even the more complex (and still controversial) case of vowel height - high, mid, and low vowels - is treated in terms of the binary principle. According to Jakobson, in these cases a single feature takes three values: "+", "-", and "+". For example, the parameter compact/diffuse is divided into two features: [+ compact] and [+ diffuse], with mid vowels specified as [+ compact, + diffuse].

Secondly, contrary to traditional analysis, always based on articulatory features, the identification of distinctive features is given in auditory (or acoustic) rather than articulatory terms. According to Jakobson, language is in its essence a spoken system and the role of the listener is as important as that of the speaker, "given the evident fact that we speak to be heard in

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order to be understood" (Jakobson, Fant and Halle, [Preliminaries], p. 13). The auditory perception of the hearer (or the acoustic signal itself) can therefore convey the necessary distinctions. Some features may be defined in both auditory and articulatory terms, but preference is given to auditory definitions. For example, tense/lax corresponds to the articulatory feature of voicing (tense = voiced).

Thirdly, the same features are used to describe both consonants and vowels simultaneously. For example, among vowels, compact/diffuse corresponds to "open" and "close" (or high and low) in articulatory terms but among the consonants, it distinguishes "front" (diffuse) from "back" (compact). Also, the distinction between grave and acute consonants is presented as parallel to the division between grave and acute vowels (grave = back vowels, and acute = front vowels).

Finally, distinctive features are not specific to a particular language. They are seen as a set of universal distinctive features. Jakobson, Fant and Halle propose a list of twelve binary oppositions detected "in the languages of the world and which underlie their entire lexical and morphological stock" ([Preliminaries], p. 40). The list comprises the following oppositions: 1) vocal/non-vocalic, 2) consonantal/non-consonantal, 3) interrupted/continuant, 4) checked/unchecked, 5) strident/mellow, 6) voiced/unvoiced, 7) compact/diffuse,

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8) grave/ acute, 9) flat/ plain, 10) sharp/plain, 11) tense/lax, and 12) nasal/oral (p. 40). Each feature is defined in terms of a language-independent set of properties. A phonological system is represented as a grid, in which the rows stand for distinctive features, and the columns for phonemes. Obviously, no language contains all of these features: languages differ in the way they select their features from this "universal" inventory, and in the ways they combine them.

A DISCOVERY PROCESS

From an epistemological perspective, it could be said that Jakobson's proposal follows the pattern called by Pariente knowledge by system. Indeed, the main characteristics of Jakobson's theory of phonological features consist in the elaboration of a fixed grid considered as universal for all languages. Once such a grid is established, the task of phonologists is to identify, for any specific language, what is the set of features selected among the various possibilities of the grid and to discover how these features are combined in this language. In this sense, such a process can be considered as a "discovery" procedure: the class to which an element belongs must be "discovered" (rather than "constructed" as it is the case with knowledge by model).

For instance, in Preliminaries..., a grid of 9 pairs of distinctive features (compact / diffuse, grave / acute, etc.) and 28 phonemes are proposed for English (p. 43). In a particular cell,

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a "+" or a "-" entry indicates whether a phoneme comprises the feature in question. For instance, the English phoneme /o/ is characterized by the following properties: [+ vocalic], [- consonantal], [+ compact], [+ grave], and [+ flat]. It must be stressed that no two phonemes have identical specifications for all the features. If it would be the case, they would not be distinguished. All redundant data possibly included in the actual usage of a phoneme are eliminated: only "the significant discriminations utilized in the code common to the members of a speech community" are retained ([Preliminaries], p. v).

In other words, phonological features of a particular language - the object to be known - are classified into a predetermined grid. Suggested features are meant to be adequate for characterizing phonetic differences between languages. All features being binary, the system allows one to state whether a segment (a phoneme) has membership in a particular pre-determined category. As mentioned by Pariente:

When dealing with a system, the object under investigation is classified into a class (or a set of classes) set up independently of it, and considered valid for every comparable object, whether human persons or historical situations (Pariente, p. 220).

(Quand on recourt à un système, on classe l'objet à connaître dans une classe (ou un ensemble de classes) constituée indépendamment de lui, et conçue comme valable pour tout objet comparable, qu'il s'agisse de personnes humaines ou de situations historiques.)

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In the case of Jakobson's phonological features, the grid is firstly established and, secondly, the particular features involved in a specific language are discovered. In that sense, knowledge achieved is knowledge of an element as a member of a predetermined class. The role of the theory is crucial in order to identify both the elements of the grid, and phonological features of a specific language. Such is the characteristic of knowledge by system.

It is a well-known fact that Jakobson's theory has been revised and criticized. It should suffice to mention that, a few years later, Noam Chomsky and Morris Halle (in The Sound Pattern of English, 1968) used distinctive features derived directly, with changes and revisions, from Jakobson's features. However, from the perspective of the present study, the aim is not to give a critical appraisal of Jakobson's phonological features. The main goal of previous paragraphs was essentially to provide a convincing illustration of the presence, among a scientific discipline such as linguistics, of a type of knowledge designated by Pariente: knowledge by system. This is why no value judgment concerning either the merits or the pitfalls of Jakobson's phonological theory was included here.

The COLT Scheme in Second Language Teaching

In the study of teaching, over 200 instruments have emerged during the past thirty years in order to describe the classroom behaviors of students and teachers (Long, [Inside the "Black Box"], 1983, p. 5). In the area of second language teaching, the same tendency was followed: at least twenty observation instruments have been designed for coding teacher behavior or student/teacher interaction in L2 classrooms. A recent tool, designated as the COLT scheme (Communicative Orientation of Language Teaching), seems particularly interesting from the present epistemological perspective (Fröhlich, Spada and Allen, [Communicative Orientation], 1985). Indeed, this observation instrument has been designed precisely "to capture differences" in the communicative orientation of L2 classroom interactions.

According to the authors, categories used in their observation scheme are derived not only from theories of communicative competence but also from the literature on communicative language teaching, and from results of empirical research in first and second language acquisition. Furthermore, various preceding instruments were reviewed. Every factor which was viewed, "on theoretical, empirical, or intuitive grounds, as relevant to the L2 classroom," was included in the scheme (p. 29).

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The COLT scheme consists of two parts: Part A contains categories derived from pedagogical issues in the communicative language teaching literature. It contains the five following major parameters: Activity, Participant Organization, Content, Student Modality, and Materials. These categories aim at measuring "the extent to which an instructional treatment may be characterized as communicatively oriented" (p. 29). Part B analyzes the verbal interaction which takes place during classroom instruction. Seven communicative features have been selected: Use of target language, Information gap, Sustained speech, Reaction to message/code, Incorporation of preceding utterances, Discourse initiation, and Restriction of linguistic form.

In both parts, major parameters include categories and sub-categories. For instance, "Classroom procedures" and "Disciplinary routines" fall under the heading "Management" in the Content parameter (in Part A). In Part B, "Ultraminimal turns," "Minimal turns," and "Sustained turns" fall under the category "Sustained speech," and so on with the other parameters.

As previously mentioned, these descriptive categories aim at capturing differences in the communicative orientation of second language classrooms, more precisely, differences in four second language programs involved in some Canadian schools (in Toronto area):

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- Core French (the regular program, in which the French language is the subject of instruction)
- Extended French (the teaching of one or more school subjects through the medium of the French language, in addition to Core French)
- French immersion programs (French used as the medium of instruction in subject matter classes)
- ESL classes (English as a Second Language classes, in which students receive English language instruction and varying amounts of subject matter instruction)

In order to capture differences in the communicative orientation of these four programs, some tentative expectations, based on preliminary classroom observations and relevant documentation, were developed. For instance, Core French classes "were expected to contain a relatively large proportion of form-focused, teacher-oriented activities." Extended French classes were "expected to be less structured and more meaning-oriented." French immersion classes were expected "to provide greater opportunity for authentic discourse and for the negotiation of significant meaning." Finally, in ESL classes it was expected that "teachers would tend to use class time to practice various aspects of the language code but that they would also seek to introduce communicative enrichment material from the 'real world' outside the classroom whenever possible" (p. 31).

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The authors emphasize the fact that the purpose of the study was not to evaluate the four programs. The purpose was "to validate" the observation instrument, a procedure which is seen as a necessary and "important step toward identifying what makes one set of instructional techniques more effective than another" (p. 50). The COLT scheme, the authors predict, will eventually be used to examine some of the process variables, within a process-product study, in order to relate the differences in the orientation of programs to language proficiency.

From the epistemological perspective adopted in the present work, COLT scheme is interesting in some respects. Firstly, it shows that knowledge by system is also used in the study of education, at least in the area of second language teaching (in this respect John Munby's book, Communicative Syllabus Design, 1978, deserves to be mentioned as another example of a similar type of classification - mutatis mutandis - in the area of second language curriculum, for defining the content of purpose-specific language programs).

Secondly, it illustrates one of the difficulties in the use of this type of knowledge in the field of education. Indeed, in the present state of development of the study of education, there is no satisfactory recognized theory which could be used as a basis for the elaboration of the different features of a classificatory grid. The authors had to include parameters derived from a great

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diversity of sources: from theories of communicative competence, from the literature on communicative language teaching, from research in first and second language acquisition, from preliminary classroom observations, and from a review of various preceding instruments. As it was recognized by the authors, the features were based on theoretical, empirical, or intuitive grounds (contrary to Jakobson's phonological features, for example, which were the elements of a unitary and coherent conceptual framework). Such is the case with all the other classification systems: "Categories tend to be the authors' own, or to be derived from an (implicit or explicit) theoretical or empirical base" (Long, [Inside the "Black Box"], 1983, p. 9).

Whatever the case may be, the COLT scheme contains all the elements necessary to be considered as an observation instrument which leads to knowledge by system. It rests on an a priori selection of variables considered relevant. The language programs examined are expected to be placed on a "communicative continuum," according to the degree to which they are communicatively oriented. In this sense, the instrument does capture "differences" in the communicative orientation of different types of L2 classrooms. It leads to the classification of an element (a particular L2 classroom) as a member of an a priori class. The tool does not lead (and, in fact, does not

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aim) to know a particular L2 classroom in its singularity, that is, in what makes it different from all the other L2 classrooms - which would be the achievement of knowledge by model.

To summarize thus far, the Rorschach test was referred to as a tool being utilized in two different but complementary ways: as a means of diagnosis for the classification of some individuals in the predetermined class of schizophrenics, and as a means of construction of the class - not predetermined - to which a particular person belongs. In the first case, the type of knowledge involved is knowledge by system; in the second case, it is knowledge by model. Then, it was shown that knowledge by system effectively characterizes Jakobson's theory of phonological features and the COLT scheme in the study of education (in the area of second language teaching). Indeed, both classification instruments imply the elaboration of an a priori grid which is considered applicable to any particular element of the discipline. In this respect, Jakobson's phonological features and the COLT scheme are similar to the utilization of the Rorschach test as a tool to detect schizophrenics. They both illustrate how linguistics on the one hand, and the study of education on the other, conceived as two domains of applied knowledge, can lead to a particular type of knowledge of an individual, knowledge by system. However, with knowledge by system, the individual is not known in its singularity, in what

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makes this individual different from all the others. To achieve such a knowledge, it is necessary to make use of a different procedure, knowledge by model, which will be presented in the next two chapters.

Chapter 6

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In the previous chapter, the characteristics of knowledge by system were presented and illustrated in three different cases: Rorschach test's diagnostic usage in the identification of the schizophrenic, Jakobson's phonological theory, and the COLT scheme in second language teaching. The aim of the present chapter is to illustrate that another type of knowledge - knowledge by model - can also be involved in scientific disciplines. In the domain of the natural sciences, the historical case of the Leyden jar, essentially inspired from Pariente's book, will be discussed. For this particular case, a few technical terms of Pariente's theory of individuality will be defined. Then, a second illustration will be presented, borrowed from the social sciences, more precisely, from Henriette Walter's phonological analysis of a language, within the conceptual framework of functional linguistics devised by French linguist André Martinet. As will be seen, in both the natural and the social sciences the process of knowledge is identical, and has the same characteristics the Rorschach has when this test is used as an instrument for the assessment of a whole personality (among non-patient subjects).

The Leyden Jar

Rejecting mathematics and the natural sciences as the model or the norm according to which the social sciences should develop, Pariente illustrates his theory of individuality by borrowing most of his examples from the social sciences. However, before presenting his examples, he examines how individuation is achieved in the natural sciences. The case discussed comes from Gaston Bachelard (in Le rationalisme appliqué, 1949) and deals with the concept of "capacitance," as applied to the Leyden jar.*

The Leyden jar is one of the simplest and earliest form of capacitor, or condenser, a device for storing electric charge. Basically, a capacitor consists of two conducting plates separated by a thin layer of insulator. The capacitance (C) of a capacitor, that is, its ability to hold charge, is the ratio of quantity of electricity on its plates to the potential difference between the plates.

* The Leyden jar "comprises a glass jar coated inside and outside with unconnected metal foils, and a conducting rod which passes through the jar's insulated stopper to connect with the inner foil. The jar is usually charged from an electrostatic generator [...] The capacitance of a capacitor depends on the area of its plates, their separation and the dielectric constant of the insulator" (The New American Desk Encyclopedia, New York: Signet, 1984, pp. 208 and 683).

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EMPIRICAL INDIVIDUALITY AND RELEVANT VARIABLES

A particular Leyden jar, with its own characteristics, is called the EMPIRICAL INDIVIDUALITY under investigation.

As mentioned by Pariente (p. 152), the first step in the elaboration of any scientific concept is the discovery of the "relevant variables" [fr. "les variables efficaces"] from the point of view adopted in the study of the object and, consequently, the elimination of the non relevant ones. Historically, it was not an easy task for scientists to sort out the relevant variables involved in what was eventually designated as the Leyden jar. Form and color of the jar were obviously eliminated from the outset. However, it took many years to realize that the surface of the plates, rather than the volume of the jar, was partly related to capacitance.

After many decades of research and experimentation, it was finally discovered that three variables were actually involved in the capacitance (C) of a Leyden jar, namely, the dielectric power of the insulator (K), its thickness (e), and the surface of the plates (S). The scientific concept of capacitance could then be seen as the product of relationships between three variables, expressed in the formula:

$$C = \frac{KS}{4\pi e}$$

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The RELEVANT VARIABLES are the variables or characteristics of the empirical individuality which seem relevant for the object under investigation, under the circumstances, the capacitance of a capacitor: the dielectric power of the insulator, its thickness, and the surface of the plates - as opposed to non relevant variables such as color, form, etc.

PUZZLING INDIVIDUALITY

Another important concept to be introduced here is the concept of PUZZLING INDIVIDUALITY [fr. "individualité-écart"] (Pariente, p. 267). A puzzling individuality consists of any empirical individuality which does not seem "normal" compared to a normal object, situation, person, etc. In the present case, the puzzling individuality is the fact that, contrary to what would normally be expected, an empirical individuality, a particular Leyden jar, has a particular capacitance, compared to another Leyden jar which exhibits a different capacitance. Such is the intriguing phenomenon to be accounted for by a scientific explanation.

At this point, it must be said that, according to Michael Sherwood (in The Logic of Explanation in Psychoanalysis, 1969), a need for explanation which will convey understanding can emerge from two varieties of situations. On the one hand, there are situations in which some phenomenon is incompatible with previous observations or previously accepted beliefs (such was the case

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with the Leyden jar); on the other hand, there are situations in which the observation is simply apart from - and not incompatible with - our past experience or body of belief: disparate phenomena do not seem to fit together. As stated by Sherwood:

the demand for explanations arises in just those situations, those contexts, in which there is perceived a puzzle, an incongruity, a lack of understanding about the way that certain facts or observations fit together (Sherwood, p. 10).

Within such a perspective, explanations are always context-dependent.*

EPISTEMIC INDIVIDUALITY

Within Pariente's perspective, a scientific concept is an entity constructed within a theory. In the present case, the scientific concept of capacitance (C), conceived as the product of specific relationships between S, e, and K, is applied to an individual Leyden jar to convert the puzzling individuality into what is called an EPISTEMIC INDIVIDUALITY [fr. "individualité épistémique"] (Pariente, p. 268). The question, "What is the capacitance of this particular Leyden jar?," has been answered, not by placing the Leyden jar in a pre-determined class, but by creating a "tailor-made" class which applied only to Leyden jars having the specific characteristics of the one under examination.

* Sherwood proposes a classification of explanations into five types: explanations in terms of origin, of genesis, of function, of significance, and of expectation (1969, pp. 22-36).

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An epistemic individuality is a construction whose nature depends upon the particular instances involved. In other words, the type of individuality achieved in scientific knowledge does not consist in a spatio-temporal entity with inherent properties, but a formal entity, a constructum. An epistemic individuality is an object of knowledge, not of experience. It consists in the transformation of a puzzling individuality into an intelligible individuality. Also, according to Pariente, a single empirical individuality can be fragmented into many epistemic individualities, according to the theories and models involved. Therefore, it is understandable why the anthropological concept of individuality should not be confused with the logical concept of individuality, which is characterized by its formal properties elaborated in scientific usage of language.

Within such a perspective, any epistemic individuality constructed by science is a notion which has the same characteristics that concepts have. As emphasized by Pariente, notions so constructed are real concepts. Indeed, on the one hand, relevant variables of the concept of capacitance define its intension, that is, they form an invariant giving the conditions to be fulfilled by a jar to be considered as a Leyden jar. On the other hand, the delimitation of a domain of application, that is, the class of all particular Leyden jars to which the concept of capacitance can be applied, defines its extension. Therefore, the notion of capacitance can be considered as a concept. Such

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is also the case with the three variables involved in the definition of capacitance, namely, surface, thickness, and dielectric power.

POSITION AND SPACE OF DIFFERENTIATION

In order to illustrate how such a concept - a scientific concept - is different from an ordinary concept, in the ordinary usage of language, Pariente introduces a few distinctions. In the case of the condenser, it is evident that relationships between the three variables involved could be established only after a numerical value was assigned to every variable. All relevant variables had to be related to a unit of measure in view of their eventual integration into a mathematical formula. In other words, a correspondence had to be established between possible values of a variable and its actual "position" within its "space of differentiation" [fr. "un espace de différenciation"] (Pariente, p. 154). However, Pariente states that metrics is not absolutely necessary for the process of individuation to take place.

The SPACE OF DIFFERENTIATION of a variable is the domain, comprised between an inferior and a superior limit, to which a variable can be applied. The space of differentiation varies according to the variable involved (on a thermometer, the space of differentiation would be, for instance, the Celsius scale).

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The space of differentiation of the surface of the plates consists in all possible numerical values that can be given to these surfaces.

The POSITION is the specific point or value taken by a relevant variable, within its space of differentiation (for instance, on a regular thermometer, the position would be the actual degree indicated by the level of mercury on a Celsius scale).

OPERATOR OF INDIVIDUATION

In science, the transition from a class to some individual entity can be made by assigning a numerical value to a concept, such as the concept of "surface" (of the plates). In the ordinary usage of language, a special linguistic device, such as indexicals* (this in this house), must be added to a concept to allow this concept to detect or reach some individual. This type of device, allowing the connection of a concept with individuals to which it can be applied, is called an OPERATOR OF INDIVIDUATION [fr. "opérateur d'individualisation"] (Pariente, p. 57).

However, in the scientific usage of language, it is useless for a concept to be associated with any other type of linguistic device, as the scientific concept offers within itself the

* In this respect, it must be mentioned that the case of proper names and definite descriptions is developed at great length in Pariente's book. As such notions are not relevant for the present purposes, they will not be discussed here.

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possibility of being numerically determined (Pariente, p. 156). In the present case, operators of individuation coincide with the relevant variables identified by the theory (K, e, and S). Obviously, to be considered as operators of individuation, variables must be given a differential value or position, within their space of differentiation. In science, operators of individuation are concepts.* And, as shown previously, these variables are characterized by both an intension and an extension, which characterize concepts.

The setting up of the intension of a concept, in the ordinary and scientific usages of language, is not founded on identical principles. In everyday usage, the point of view adopted varies from one concept to the other: for example, within the vocabulary of habitation, a concept or word like "hovel" [fr. "masure"] is classified according to the point of view of the condition of the construction; a concept or word like "hut" [fr. "cabane"] is classified according to the point of view of the building material (Germain, [Sémantique], 1981, pp. 120-133). In order to be individuated, every concept must necessarily be assigned an operator that allows the detection of the object. According to Pariente, ordinary concepts allow us only to detect or locate individuals, not to apprehend them.

* It follows that, in order to progress, scientific knowledge can modify either its own theoretical concepts, or its operators of individuation, or both its theoretical concepts and its operators of individuation (Pariente, p. 173).

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With scientific concepts, the situation is different:

the scientific concept, on the contrary, encompasses its operators of individuation.
(Pariente, p. 156 - underlined by author)

(le concept scientifique enveloppe, au contraire, ses opérateurs d'individualisation.)

In the scientific usage of language, the invariant is the result of a methodical, instead of a varying and intuitive, process of classification (Pariente, p. 155): the concept refers to a procedure that links different specific variables which have their own space of differentiation. For instance, to apply the general formula of capacitance to the particular capacitance of a given condenser, it is sufficient to assign each variable a position (here: a numerical value) within its space of differentiation. Individuation is performed with the determination of every position of the variables. With scientific concepts, individuation is less free but more rigorous. For example, expressions like "the capacitance of the left condenser" or "the capacitance of the condenser we used yesterday" are not scientific because their intension rests on the knowledge of some pragmatic conditions of usage; these expressions individuate, but according to contingent points of view, compared to science that allows individuation according to a methodical procedure. Indeed, our everyday terms fulfill their task as long as they enable us to communicate, but with science a methodic or systematic view of the world is introduced. In order to individuate, scientific

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concepts do not have to be associated with other units: the concept of capacitance is in itself the concept of each single capacitance (of a condenser).

Scientific concepts encompass operators of individuation relevant for the object under investigation. In science, an individual is not defined spatio-temporally; it is a conceptual object constructed by means of a language. A scientific concept can isolate a phenomenon only by differentiating it from the others, thanks to its relevant variables that act as operators of individuation. In other words, scientific concepts can be applied by themselves to every element of classes they define. There is no reference to intuitive knowledge, contrary to ordinary concepts.

Scientific concepts, acting themselves as operators of individuation, can therefore be considered as a valuable and valid means to reach the individual. Three basic properties inherent to scientific concepts are related to the issue of individuation. Firstly, scientific concepts allow us to differentiate between relevant and non relevant variables of an empirical individuality. Secondly, when a particular value or position is assigned to a concept, within its own space of differentiation, it becomes possible to identify the various forms taken by the phenomenon investigated. Finally, scientific concepts systematically define relationships between two particular forms of a phenomenon (Pariente, p. 157).

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At this point, it must be said that the list of basic technical notions used in Pariente's theory of individuality has not yet been exhaustively presented.* A few concepts are still to be defined. Essentially, they are the two following pairs: object-features / factor-features, and model / theory. For convenience of presentation, correlated concepts of object-features and factor-features will be set forth in subsequent paragraphs and, therefore, exemplified with the issue of the individuation of idiolects. Concepts of model and theory, which are basic terms of Pariente's conceptual framework, will be presented in the next chapter.

Individuation of Idiolects

In order to illustrate how social sciences can achieve some knowledge of individuality, Pariente examines psychoanalysis, geography, clinical medicine, and comparative mythology. Only some sporadic references are made to linguistics. In the present study, the case of structural phonology will be systematically examined. Scientific concepts of Pariente's theory of individuality which have been already presented with regard to the Leyden jar will be reexemplified in the present chapter, and two

* In the example of the Leyden jar (pp. 152-157), Pariente presents only a few terms: relevant variable, space of differentiation, position, and operator of individuation.

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new important concepts (object-features and factor-features) will be explained as the study proceeds. A fundamental premise of the investigation, borrowed from Pariente's philosophy, is that the process of individuation is identical in both the social and the natural sciences. Essentially, the idea is to establish how a process of individuation can be brought into play in a social discipline such as linguistics. More precisely, I shall attempt to show, using Pariente's conceptual framework, how individuation of idiolects - a case not mentioned in Pariente's book - can be achieved.

An idiolect can be defined as the dialect of an individual. Therefore, the problem is the following: how is it possible to achieve a scientific knowledge of the phonological system of a particular person? In order to show how someone can actually proceed, reference will be made to the recent attempt made by Walter, and published in her books: La phonologie du français (1977) and Enquête phonologique et variétés régionales du français (1982).

WALTER'S SURVEYS

Walter's study involves three different but complementary steps. The first one was to give a description of the "common system" of French phonology, that is, of the system of oppositions of phonemes apparently shared by everybody in France. Once such a system was established, Walter analyzed idiolects which a priori

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seemed to vary the most, compared to the common system. Finally, Walter's project comprises a statistical survey (in progress), based on a representative sample of French people, in order to establish some eventual correlations between particular phonological systems and extra-linguistic factors (like geographical area, age, socio-cultural status, etc.).

For clarity of presentation, a brief description of Walter's methodology, involving three steps, will be given firstly. A discussion of both the type of knowledge achieved and the process of individuation involved will then follow. For the present purposes, I shall essentially concentrate, from an epistemological perspective, on the second stage of Walter's research, that is, the methodology used to describe a few idiolects. The two other surveys reported here - the first and third steps in her methodology - must be seen as a prerequisite for a better understanding of the context of her research.

The "common system"

To begin with, Walter attempted to establish common French: What is the phonological system, common to all French people living in France? What are the phonological oppositions which are shared by everybody? What is their common denominator? In order to achieve this task, she proceeded to a detailed description of the phonological system of 17 informants living in Paris, born either

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in Paris or in one of the different provinces of France ([La phonologie], 1977, p. 17). The choice of Paris as the source of common French is a controversial issue, but Walter argues that Paris, the center of political, economical and cultural activities, is a melting-pot, which is representative of the evolution of the French language: all regional or provincial characteristics are mixed up and gradually melt away to form the average French language. The result, available in La phonologie du français (1977), is a common French system consisting in the set of all phonological oppositions that can be found in the 17 Parisian native informants used for her research.

Analysis of idiolects

Having established a common point of comparison, Walter could then proceed to the second dimension of her investigation. This part of the research was still considered as a pre-survey: the aim of the study was to analyze and describe idiolects in order to draw up an inventory of all possible phonological oppositions in the French language: what are the varieties of French language, that is, what is the nature of the different regional systems, compared to the common phonological system?

In order to choose people to be interviewed, a new linguistic atlas of France was drawn by the author, mainly based upon old (historical) French provinces and upon up-to-date information on

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the characteristics of the pronunciation in every area: 35 linguistic territories were identified on a French map. Then, an average of three informants by region were chosen, which resulted in a total of 111 informants. Given the aim of the pre-survey, the informants had to be chosen from the more stable people of every region, that is, among those who had spent most of their life in the area, and who had scarcely travelled. It must be stressed that, in order to discover what could be identified as the most extreme parts of the system of phonological oppositions, compared to the common system, the author did not look, at this phase of her research project, for a representative sample of the area. The phonological system of every one of the 111 informants was then analyzed, and compared to the previously established common French phonological system. The result, that is the detailed description of 111 French idiolects, has been published in her book Enquête phonologique et variétés régionales du français (1982).

Dynamics of the system

Based on the results of the above research, a complete phonological questionnaire has been devised and will eventually be submitted to a representative sample of the French population (this part of Walter's research project is in progress). The idea is to examine the external pressure on French phonological systems: what are the most important variables, such as age, sex, geography, socio-cultural status, and style, which could be

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statistically correlated with the characteristics of the previously established common and regional systems? It is interesting to note that, according to Walter, geographical differences are at first glance more significant in France than social differences, contrary to the situation prevailing in the United States ([Enquête phonologique], 1982, pp. 50-51). Whatever the case may be, the expected result is a broad picture of the "dynamics" and the evolution of the language.

THE PROCESS OF INDIVIDUATION

Having briefly described the context of Walter's investigation, I shall examine, from an epistemological perspective, two essential issues implied in her attempt to analyze a few phonological idiolects: the type of knowledge and the procedure of individuation involved.

For a more convincing analysis, I shall make reference to one particular idiolect (number 29 h in Walter's book), chosen among the 111 idiolects. This choice is more or less arbitrary. Indeed, in her book ([Enquête phonologique], 1982), Walter was constrained by the editor to give an abridged version of her results for most of the idiolects analyzed. However, she was allowed to give a detailed description for 15 of them (out of a total of 111), among those she considered as the most interesting cases from a phonological perspective. The informant chosen here

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- one among the 15 elected by Walter - comes from the city of Hasparren (Basques), in the vicinity of the Pyrenees Mountains, near Spain. At the time of Walter's survey he was 72 years old.

Empirical individuality and puzzling individuality

According to Pariente's philosophy, the EMPIRICAL INDIVIDUALITY consists in the linguistic corpus of the informant, that is, his linguistic realizations, as recorded by Walter.

In order to determine the number of phonemes, Walter made reference to both a principle of relevancy (the communicative function) and a technique (the commutation test). Such is the linguistic procedure which permitted the identification of the PUZZLING INDIVIDUALITY of the chosen idiolect. The phonological system of the analyzed idiolect is characterized by the presence of 22 consonants and 7 vowels. The puzzling individuality consists in the set of phonemes which are different from the phonemes of the common system. In the present case, the idiolectal system is comprised of 22 consonants, compared to 19 for the common system: the object of the puzzlement is the presence of these 3 additional phonemes: /r/, /λ/, and /h/.

Position and space of differentiation

Physiologically, the articulation of consonants differs markedly from that of vowels. This is why terms of reference used to

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describe vowels and consonants have usually been distinct. It follows that terms used to describe the SPACE OF DIFFERENTIATION of vowels and consonants are different.

Furthermore, it must be added that for consonants, three combined basic dimensions or - within Pariente's terminology - spaces of differentiation, are involved:

- voicing (e.g., voiced-voiceless)
- place of articulation (dental, palato-alveolar, velar, etc.)
- manner of articulation (affricate, nasal, etc.).

For example, the English phoneme /ʃ/ would be described as a voiceless palato-alveolar fricative (Hawkins, Introducing Phonology, 1984, p. 74).

Vowels are described by four basic dimensions or spaces of differentiation:

- length (short-long)
- the 'vertical' point of reference (close-open, or high-low)
- the 'horizontal' point of reference (front-back)
- rounding (unrounded-round).

For example, the English phoneme /e/ would be described as a short mid front unrounded vowel (Hawkins, p. 74). More precisely, in the case of the 'vertical' point of reference, the space of differentiation of vowels is the set of the four possible

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degrees of openness. Every specific degree of openness designates the POSITION of the vowel within its space of differentiation.

Object-features and factor-features

Within Pariente's conceptual scheme, every puzzling phoneme would be designated as an OBJECT-FEATURE. Indeed, an object-feature of an empirical individuality comprises the characteristics which need to be explained. They constitute the explanandum.

The particular system analyzed comprises only 7 vowels, compared to 12 for the common system: /i/, /e/, /a/, /y/, /ø/, /u/, and /o/ (the phonemes /ɛ/, /ɔ/, /œ/, /ɑ/, and /ɛ:/ are missing in this idiolect). These vowels are distributed into three degrees of openness, compared to the usual four degrees. Under the circumstances, the presence of these 7 vowels and their reduced degree of openness is an object of puzzlement: every one of the 7 vowels forms an object-feature - an explanandum - of the vocalic system of the analyzed idiolect. The set of these 10 object-features (3 in the case of consonants, and 7 in the case of vowels) constitutes the puzzling individuality of the idiolect investigated.

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However, as the vowels also include 4 nasals, the system of nasal vowels is identical with the common system: therefore the nasals do not form a part of the puzzling individuality. They constitute NON RELEVANT VARIABLES.

Every phonetic characteristic of a consonant (voiced, dental, etc.) can become a relevant feature in phonology. Indeed, at the level of phonological analysis of a particular language, the phonetic features of such a language are taken as a point of departure and serve as data of analysis. For instance, according to Martinet's phonological theory, following the Prague School (mainly, Trubetzkoy), every phonetic feature which is non-relevant from a communicative point of view is put aside: "Some elements of the sound flow are indeed unimportant for the phonologist" (Trubetzkoy, Principles of Phonology, c1938-1969, p. 13). Generally speaking, it can be said that while phonetics is concerned with the material aspects of human sounds, phonology only deals with "that aspect of sound which fulfills a specific function in the system of language" (Trubetzkoy, p. 10 - underlined by author).

In other words, at the phonological level, only some relevant features are retained for the definition of every phoneme. For instance, at the general phonetic level, a sound like [l] can be described as composed of many features like [orality], [sonority], [laterality], [alveolar], etc., and can be characterized by

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its pitch and its duration. For communicative purposes, the only feature [laterality] is necessary and sufficient for the definition of the French common phoneme /l/: other features are not relevant from a communicative point of view.

Phonetically, a sound like [b] is described with features like [orality], [sonority], [bilabiality], etc. and is also characterized by its pitch, its duration, etc. At the level of phonological analysis, the phoneme /b/ can be defined with three distinctive features, which are the necessary and sufficient conditions to distinguish it from any other French phoneme: [orality], [sonority] and [bilabiality].

In the first case, such features like [orality], [sonority], and [alveolar] are put aside because, as it is revealed through the technique of commutation, there is no other phoneme in common French which is [lateral] and not [oral], [voiced] and [bilabial]. In French, /l/ and /r/ are phonologically defined by only one necessary and sufficient feature, [laterality] and [vibrant] respectively. However, all of the three phonetic features of the sound [b] must be retained at the phonological level. In sum, structural phonology clearly shows how phonological entities are grounded on phonetic characteristics of sounds.

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From the epistemological perspective adopted here, relevant phonological features (such as [laterality], [voiced], [bilabial], etc.) form FACTOR-FEATURES. Factor-features are the explanans. They are characteristics of the empirical individuality which are used to explain object-features. However, it must be emphasized that in order to explain an object-feature, a factor-feature must be assigned a position within a certain space of differentiation (which corresponds to a numerical value in the natural sciences) as defined by the theory and the model utilized. When a position is assigned to a factor-feature, such a factor-feature is also an OPERATOR OF INDIVIDUATION. And, as seen previously, an operator of individuation is a scientific concept which makes the necessary links between some universal law or principle and a particular variable.

Factor-features are the distinctive features which define or explain every object-feature: in the case of the idiolect analyzed, which is characterized by the presence of two types of "l," factor-features are [apical] + [lateral] for /l/, and [palatal] + [lateral] for /λ/, compared to the only relevant feature [lateral] for common French. The explanation is that, contrary to common French, the /l/ in this case is not only lateral but also apical. In the other case, the /λ / is not only lateral as in common French, but also palatal. The presence of a certain number of puzzling phonemes (that is, the set of object-features which form a puzzling individuality) and particular

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relationships between these phonemes are explained by the simultaneous presence of specific features - also found in other phonemes - that is, by means of operators of individuation present within the empirical object itself. The individual is therefore its own principle of intelligibility.

At this point, it is interesting to compare the type of analysis proposed here with what was previously seen in the case of the Leyden jar. The formulae used to define puzzling phonemes, such as:

$$/ l / = [lateral] + [apical]$$

$$/ \lambda / = [lateral] + [palatal]$$

are, mutatis mutandis, like the formula used to measure the capacitance of a capacitor:

$$C = \frac{KS}{4 \pi e}$$

In this chapter, a few notions of Pariente's theory of individuality were introduced and applied to the Leyden jar. This case was chosen in order to illustrate how the process of individuation is involved in the natural sciences. In the domain of the social sciences, the individuation of idiolects, as realized by Walter, was presented. Pariente's conception of individuation was again exemplified, and two new concepts were introduced. By

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now, Pariente's conception of the process of individuation involved in scientific knowledge should be clear, except for the two last notions to be introduced in the next chapter, theory and model, and their relationships with the two types of knowledge previously mentioned, namely, by system and by model.

Chapter 7

THE IDIOLOGIC APPROACH (II)

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In the two previous chapters, the characteristics of both knowledge by system and knowledge by model were explained and exemplified. Nevertheless, as previously mentioned, for convenience of presentation two essential notions had intentionally been set aside: the correlated concepts of theory and model. In this chapter, these two concepts will be examined and, as far as possible, illustrated with a few concrete examples. In the first part, the nature, status and role of a theory will be examined. Then, the next section will be devoted to the nature of a model and a few correlated concepts. Finally, a brief study of the relationships between a model and a theory will be undertaken.

THEORY

The term "model" is often used to refer to any scientific "theory." However, within Pariente's conception of knowledge, a distinction must be drawn between a model and a theory.

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NATURE OF A THEORY

Within Pariente's perspective, theories or principles play an essential part in the elaboration of scientific concepts. They are not only calculating devices having the status of useful instruments but are considered as an essential ingredient of scientific knowledge, whatever the type involved (knowledge by system or by model). A theory plays a prominent part in the elaboration of knowledge, at every step in the process of individuation. A theory is conceived as a set of propositions enunciating relationships, universally valid in principle, between certain classes. According to Pariente, a theory encompasses three articulated sets: a set of classes, a set of relations between elements of these classes, and a set of operators of individuation (Pariente, p. 279). The elaboration of every set is dependent upon the elaboration of the others: once a process of selection has been made according to some point of view, only certain classes, certain types of relations, and certain operators can form a theory:

- set of classes
- THEORY: - set of relations between classes
- set of operators of individuation

Certain features of the empirical individuality studied, considered as non relevant, are necessarily neglected. For

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example, in linguistics, structural phonology takes into account only phonetic features that are relevant to the point of view adopted in the analysis, namely, the "communicative function."

Principles of autonomy

The issue of classes and relations between classes has been exemplified in the previous chapters. As a theory encompasses a set of operators of individuation, the related question which now deserves to be taken into consideration is the following: on what principles is founded the elaboration of operators of individuation? The formation of operators of individuation in science lies on two complementary principles of autonomy. Firstly, there is a principle of autonomy of any scientific usage of language compared to its ordinary usage. In some scientific disciplines, like logic and mathematics, a confusion between the two types of usage is unlikely. Nevertheless, as claimed by Pariente, in some specific disciplines such as sociology or history, the chances of confusing the two types of usage of language, which would therefore prevent the construction of operators of individuation, are much greater. The "actual experiences of life" [fr. "le vécu"] could easily be taken as a criterion of differentiation in the elaboration of scientific knowledge: in fact, the result would look more like ideology than genuine knowledge. In such a case, the differentiation of

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objects would be made, unfortunately, according to some spontaneous point of view rather than according to some theoretical construct (Pariente, p. 242).

According to Pariente, with the discipline of history the problem lies precisely in the actual absence of epistemic individualities, due to a confusion of the two different types of usage of language (ordinary and scientific). The first principle of autonomy is not enforced: there is no segregation against actual experiences of life. There is no autonomy from the ordinary usage of language.

Secondly, there is a principle of autonomy of a science compared to other scientific disciplines. In this respect, the case of linguistics should be carefully examined. For instance, within phonological analysis, segmentation of words into phonemes is based on the premise that every utterance in any language is analyzable into a succession of distinctive units: these units are discrete and their number is strictly determined in every language (Martinet, [A Functional View], 1962, p. 6). In order to determine the number of phonemes of a particular language, reference must be made to both a principle of relevancy and a technique. The linguistic criterion or principle of relevancy of functional linguistics devised by Martinet is "the communicative function." Two sounds are considered as two different phonemes if they transmit a different message. For instance, /p/ and /b/ are

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two distinct phonemes if they convey two entirely different meanings when used in minimal pairs like /pjɛr/ (fr. "Pierre" - Peter) and /bjɛr/ (fr. "bière" - beer). The technique used is the well-known substitution test called "commutation:" for instance, in the previous example, the sound [p] is substituted by the sound [b] in an identical linguistic context.

However, all cases are not always as easy as the previous one. Indeed, in a case like the Spanish word mucho, it is not clear, at first glance, if the word is made up of four or five successive phonemes: does the group of sounds [tʃ] contain one or two phonemes? According to phoneticians, there are two distinct sounds: [t] and [ʃ]. Nevertheless, at the phonological level, within Martinet's functional perspective, there are only four phonemes in the word mucho. The segment corresponding to the ch group of the spelling is one and the same phoneme, even if it begins as a stop [t] and ends as a fricative [ʃ]. The reason is the following: if we suppress the initial [t] from this complex of sounds, or even if we substitute it for a different sound, we obtain impossible forms in Spanish ([ʃ], [pʃ], etc). In other words, the fricative [ʃ] never occurs in Castilian Spanish without the preceding stop. There is no free choice. Therefore, this stop is automatic and not distinctive (Martinet, 1962, p. 6).

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The opposite situation can also be found in a language. For instance, in German, word-final consonants [t] and [d], as in der Rat (the council) and das Rad (the wheel), have the same pronunciation, contrary to what occurs in French or English. In German, the final sound [t] cannot be defined as a voiceless phoneme, because there is no corresponding voiced phoneme in final position: in this context, [t] is therefore conceived as the actualization of the archiphoneme /t-d/. The opposition is neutralized: there is neutralization. In this situation, contrary to what was the case with the complex sounds [ts] in Spanish, phonological analysis distinguishes what was shown to be physically identical at the phonetic level. Here again, it is clear that identification of phonemes cannot be simply traced from a superficial examination of empirical sounds.

In other words, even if phoneticians supply phonologists with the material to be investigated, empirical sounds of a language, the phonological individuality or unit (the phoneme) should not be confused with the phonetic unit (the sound). Individuation of phonemes cannot be copied on individuation of sounds. The phoneme is a theoretical construct (an epistemic unit) consisting in the grouping of some relevant features; the sound is an empirical unit. The determination of the units involved in a particular discipline does not only rest on simple observations but on some theoretical construct. In general, it can be said that

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the determination of epistemic entities is an issue that must be examined by each individual science, and whose solution should not be borrowed from any other discipline, even a neighbour one (Pariente, p. 244).

(la détermination des entités épistémiques est un problème que chaque science doit poser pour elle-même, et dont elle ne peut emprunter la solution à aucune autre science, même voisine.)

The case of linguistics in general is also instructive in many respects. Indeed, for many years the study of language was identified with logic or reason, or conceived as a product of collective thinking and, consequently, placed at the intersection of sociology and psychology. With Swiss linguist Ferdinand de Saussure, the establishment of the study of language for its own sake led "to the foundation of an autonomous science of language through a drastic severance of all its ties with physical and psychic reality." (Martinet, 1962, p. 2). Self-sufficiency of linguistics resulted from the rejection of such a double dependence on psychology and sociology:

The most remarkable achievement of contemporary linguistics is probably the final assertion of its legitimacy as a completely autonomous discipline with its own object, aims, and methods (Martinet, 1962, p. 1).

In brief, individuation of epistemic objects implies a double segregation: a segregation against actual experiences of life, and a segregation against other forms of knowledge (Pariente, p. 243). Therefore, scientific autonomy must be achieved at two

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different levels: autonomy must be both general - compared to everyday experience - and local [fr. "régionale"] - compared to other modalities of knowledge (Pariente, p. 246).

STATUS OF A THEORY

In previous chapters, two types of knowledge of the individual were illustrated: knowledge by system and by model. In the examples examined, it appeared that knowledge always involves a principle of classification and that there is more than only one procedure to follow in order to classify objects: objects can be classified into two different types of classes. In knowledge by system, the object to be known is classified into a class or a group of classes valid for all similar objects (human beings, historical situations, or whatever). Therefore, an individual is known as an element of a preconceived class: its singularities must be neglected, in order to see in it only features that are shared with other elements of the same class. Such are the cases of the Rorschach test used as a means of differentiation of schizophrenia, and the Jakobson grid of universal phonological features. In a system, an individual is known only as an element of a class.

In the method of models, the object falls into a class or in a group of classes according to its own singularities. Every single model corresponds to only one object. An intelligible scheme of an empirical object is elaborated in order to discover

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its singularities. For example, Walter's model of idiolect number 29 h (from Basques) cannot be transferred to the case of the idiolect number 14 f (from Poitou). In a model, an individual is known qua individual. Knowledge by model leads to knowledge of the individual in its singularity.

Knowledge by model corresponds only to a single case; knowledge by system, in principle, can be universally applied.

In these two types of knowledge, the status of theory is different. While knowledge by model uses operators of individuation, knowledge by system does not. As mentioned by Pariente:

In knowledge by system, the situation is totally different: as a system is not provided with conceptual operators of individuation, it can only treat individuals which are referred to it as elements of classes; thereby, it forces back their individuality to the so called empirical level, outside the conceptual field. (Pariente, p. 286, footnote 74)

(Quand il s'agit d'un système, il en va tout autrement: le système n'étant pas muni d'opérateurs d'individualisation conceptuelle, il ne peut traiter les individus qui lui sont soumis que comme éléments des classes dont il est composé; de ce fait, il refoule leur individualité proprement dite au niveau empirique, à l'extérieur du champ conceptuel.)

The status of a theory is different in each case. On the one hand, as it was the case with Jakobson, the theory already possesses answers to all questions: the only problem is therefore to discover to which class, previously established, an element belongs. All situations in which an individual can be found are

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pre-defined. A theory acts as "a discovery procedure:" it allows to "discover" which class fits best the object studied (Pariente, p. 221). A theory can be identified with the system.

On the other hand, as it was the case with Walter, once a theory is established, it acts as "an invention procedure" (Pariente, p. 221). A theory is not already a solution to the problem under investigation: it must allow the elaboration of a specific solution to every single case. In the method of models, a theory looks like a matrix encompassing an indefinite number of models that the scientist must elaborate for every different case.

According to Pariente, only the type of knowledge achieved by means of a model can give rise to a genuine knowledge of the individual, that is, apprehend some individuality in its singularity. Preference given to one type over another is essentially a question of goal. If the goal of the research, as it is the case with one of the two broad domains of application of the Rorschach test, is to classify some individuals as members of a class (the class of schizophrenics), knowledge by system should be prescribed. However, if the goal of the research, as it is the case with the other common utilization of the Rorschach, is to achieve some knowledge of a particular person in its singularity (the reconstruction of a whole personality), then knowledge by model should be the rule. The adoption of one type of knowledge rather than the other depends, above all, on the research goal.

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The two types of knowledge of the individual can be pursued in science, according to the prescribed goal. To a different goal corresponds a different procedure.

In the case of phonology, as the goal of Jakobson was essentially to identify the phoneme pattern of any language, his procedure could be said to be appropriate. On the contrary, as Walter's goal is to describe idiolects in emphasizing their particularities, the procedure should also be considered as appropriate. Obviously, the goal assigned to a scientific discipline can be discussed and criticized. However, once a goal has been carefully selected, it should be clear which one of the two procedures should be followed: knowledge by system or by model. To use Pariente's analogy, systems are like "ready-made suits," and models are like "suits made to measure" (p. 227). Both types of suits are necessary.

It should also be noted that knowledge by system and by model are two forms of knowledge with possible links between them. In this respect, both cases of Jakobson's phonological theory and Walter's analysis of idiolects should be examined. In the case of Jakobson, it is interesting to observe that revisions of his distinctive features, a few years later by Chomsky and Halle, were made with a different purpose. While one of Jakobson's purposes was to provide a "maximally economic" set of features, Chomsky and Halle's main goal was to provide a set of appropriate

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features for the phonological rules necessary to link abstract "deep" representations with concrete "surface" representations (Hawkins, Introducing Phonology, 1984, p. 91). As phonological features are used to express a wide variety of phonological processes enabling to formulate rules, they can be considered as operators of individuation: for instance, in English, features must be specified to relate [k] to [s] as in 'criticiz' - 'criticize', or [d] to [ʒ] as in 'divide' - 'division', or [ai] to [i] as in 'divine' - 'divinity' (Hawkins, p. 91).

It would be inappropriate to develop in detail Chomsky and Halle's conception of features, conceived as an illustration of knowledge by model. The only point to be stressed here is the fact that their conception was inspired by Jakobson's theory of phonological features. It implies that knowledge by model can be based upon knowledge by system.

The case of Walter's phonological analysis is just the opposite. It illustrates the fact that knowledge by system can be linked to knowledge by model. Indeed, as mentioned in the previous chapter, in its last step Walter's research is devoted to the study of the dynamics of the language. External pressures on French phonology will be examined. However, in order to achieve this goal, Walter aims at identifying all possible oppositions of French language. Once this work will be done, a complete phonological questionnaire will be submitted to a representative

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sample of the population. In a certain way, such a questionnaire will have the same characteristics as Jakobson's phonological grid: it will consist in a grid of all possible oppositions of the language. The only difference being that in the case of Jakobson's theory, the grid is "universal" and applicable to any language in the world; in the case of Walter's research, the grid is "universal" for French language only. In both cases, there is a pre-determined grid into which some elements must be classified.

ROLE OF A THEORY

Broadly speaking, it can be said that, within Pariente's perspective, a theory is involved at every step in the process of individuation. Indeed, a theory is involved

in the choice of object-features, which have to be relevant; in the identification of factor-features likely to be used in the explanation of object-features; in the discovery of operators of individuation; in the explanation of object-features by factor-features; in the construction of the epistemic individuality; in the setting up of intelligible relationships between the empirical individuality and the epistemic individuality (Vachon, [Un modèle freudien], 1987, p. 102).

([la théorie intervient] dans le choix des traits-objets, qui doivent être pertinents; dans l'identification des traits-facteurs susceptibles d'expliquer les traits-objets; dans la découverte des opérateurs d'individualisation; dans l'explication des traits-objets par les traits-facteurs; dans la constitution de l'individualité épistémique; dans l'établissement des relations intelligibles entre l'individualité empirique et l'individualité épistémique.)

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For a better understanding, the role of a theory at every step of individuation deserves to be examined in more detail.

Sorting out relevant and non relevant variables

In order to give rise to scientific knowledge, within Pariente's perspective, a theory is essential because it is in the theory that can be found the principle of relevancy, which is necessary to sort out relevant from non relevant variables. For instance, phonologists must make reference to functional phonological theory for the segmentation of words into phonemes within a given corpus (for instance, non relevant variables of the idiolect analyzed are the four nasal vowels, which correspond to the common system). Once the phonemes of a specific dialect were identified, they were compared to common French phonemes and, as a result, a puzzling individuality was devised.

In knowledge by system, a theory plays a similar role. Indeed, a theory is necessary in order to select relevant variables, which are assigned as elements of a class. Such is the case with the Rorschach test which is dependent upon psychological theories for the diagnosis of schizophrenics. As mentioned by John E. Exner, "in part, the difficulties posed in the identification of schizophrenia stem from the basic conceptualizations about schizophrenia" (Exner, 1986, p. 416). Such is also the case with Jakobson's theory: phonological features are selected according to the theory involved.

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In this respect, it must be mentioned that, in the previously mentioned phonological research, Walter herself recognizes the crucial role of phonological theory, at least concerning the distinction between relevant and non relevant variables:*

Numerous phonetical nuances would have led to confusion in the absence of the framework given by phonological theory which allows to make a distinction between relevant and non relevant linguistic facts (Walter, 1977, p. 154).

(L'existence de nuances phonétiques innombrables aurait pu nous plonger dans la confusion si nous n'avions pas à notre disposition le cadre que procure la théorie phonologique et qui permet de distinguer ce qui est pertinent de ce qui ne l'est pas.)

In other words, within Walter's perspective, the criterion of analysis, that is, a difference in the meaning of the words uttered, is given by phonological theory, in order to make a distinction between relevant and non relevant phonetic facts.

Selecting object-features and factor-features

Furthermore, as seen in the previous chapter, among relevant variables a distinction must be made between object-features (the set of object-features constituting a puzzling individuality), and factor-features. Both object-features (for instance, the presence of three additional consonants in the idiolect examined,

* In the context of this quotation, it must be added that by "relevant facts," Walter makes only reference to "factor-features," within Pariente's terminology.

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and its reduced number of vowels) and factor-features (phonetic features necessary for the definition of every phoneme, and their relationships) form relevant variables. Phonological theory is necessary, by means of a conceptual model, in the selection, among relevant variables, of both object-features and factor-features. As mentioned by Martinet, "setting apart a feature as 'distinctive' implies that its function suffices to make it an object of interest and assign it to a definite class." (Martinet, 1962, p. 3). The individual encompasses its own principle of intelligibility: factor-features are found within the individual under investigation. As factor-features are the explanans of the phenomenon under investigation, it can be said that the theory is used in the explanation of object-features by means of factor-features.

Identifying operators of individuation

Phonological theory was also necessary in the identification of operators of individuation, that is, of the different features with their position within a certain space of differentiation. For instance, the space of differentiation of the different idiolectal vowels, including only three degrees of openness, is obviously different from the usual space of the common system of vowels, characterized by four degrees of openness.

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Constructing epistemic individuality

The process of individuation is achieved with the construction of an epistemic individuality. In the present case, epistemic individualities are the different phonemes and their relationships once they have been explained by the different factor-features involved, that is, by means of operators of individuation. Thus the result is a constructum out of an empirical individuality. In addition, it must be reminded that according to the nature of the theory involved, an empirical individuality can be fragmented into many epistemic individualities, through the intermediary level of a puzzling individuality. However, none of these epistemic individualities totally covers an empirical individuality.

Relating empirical and epistemic individuality

Finally, functional phonological theory was necessary to establish intelligible relationships between empirical and epistemic individualities. The transformation of the notion of individuality, from an empirical one to an epistemic one, through the intermediary stage of a puzzling individuality, is due to the theory involved. Indeed, the set of object-features (or puzzling phonemes) constitute a class (or conjunction of classes): the class of phonemes defined by the same features. As a member of a class of phenomena, a particular phoneme can be related to general or universal principles, through the theory involved. For example, the particular phoneme /l/ of the idiolect can be considered as explained once it has been recognized that its

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proper features ([lateral] + [apical]) are the features used in the composition of all possible /l/ used jointly with the phoneme /λ/ (which is [lateral] + [palatal]). There is explanation because what was previously seen as a puzzling entity is now seen as a member of a class, which is explained by the presence of specific characteristics.

MODEL

NATURE OF A MODEL

In the epistemological literature, there seems to be as many different conceptions of a model (and the same could be said concerning a theory) as there are authors. Furthermore, the perennial debate concerning the role of models in the elaboration of scientific knowledge is still open: are models mere aids, or logically essential for a theory to be accepted as scientific? The very well-known "dialogue" between Campbellians and Duhemists, imagined by Mary Hesse a few decades ago, reflects these two opposite views (Hesse, [Models], c1966-1970). Obviously, it all depends upon what someone means by a model.

The "representer" and the "represented"*

For a better understanding of Pariente's interpretation of a model, it must be understood that a model is seen as a reality -

* The translation suggested here for "représentant" ("representer") and "représenté" ("represented") is based on the usual translation of Saussure's linguistic concepts of "signifiant" ("signifier") and "signifié" ("signified").

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the "representer" [fr. "le représentant"] - that refers to another reality - the "represented" [fr. "le représenté"] (Pariente, p. 273). Such is the "internal duality" of a model. A model not only possesses a certain reality but also refers to another reality.

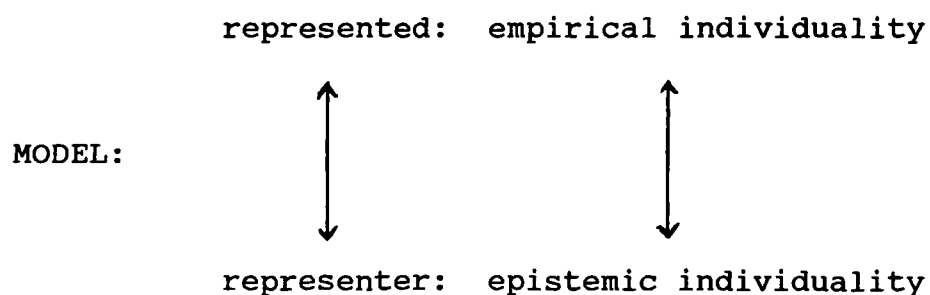
According to a few researchers, a model is conceived as a three-dimensional physical representation of an object, such as tinkertoymodels of molecules, models of the solar system, engineering models of dams, turbomachines, airplanes, ships, a rolling ball model of radio signals, etc. (Achinstein, [Concepts of Science], 1968, p. 209). Models of this type, particularly used in engineering, refer to objects of a similar nature, or to objects that can be put on different scales. Every scale model of a large object reduced in size is therefore considered as a model of this type. But, as stated by Pariente, such models always imply a process of epistemic transfer: knowledge acquired by analysis of the representer is transferred to the represented.

In logic and mathematics, some "formal" models are used. But, in these cases, whereas the represented is a formal system, the representer is an empirical individuality (Pariente, p. 275). In other words, a model is seen as an interpretation field, in which the represented (for instance, an algebra formula such as $\underline{a} + \underline{b}$) is more abstract than the representer ($\underline{a} + \underline{b}$ represented by two line segments). Such a conception is precisely the opposite of

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Pariente's conception of a model: in logic and mathematics, the most abstract element is the represented; within Pariente's perspective, it is the representer which is the most abstract element.

In previous chapters, a distinction, illustrated by the case study of structural phonology, has been made between two types of individualities: empirical and epistemic. However, these individualities must not be conceived as two completely separate types. Some relationship is always involved between the two. According to Pariente, the represented of a model is an empirical reality and its representer, an epistemic reality (Pariente, p. 277). Such a conception could be illustrated by the following schema:



Within such a perspective, a model is the set of intelligible relationships between empirical and epistemic individualities. To know a reality is therefore to be in a position to give a rational explanation of such a correspondence, by means of operators of individuation.

In this respect, it should be mentioned that it can happen, as it is actually the case with generative-transformational grammar

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inspired by Chomsky, that a theory is so simplified that its epistemic properties - at the level of linguistic "competence" - cannot be met in corresponding to empirical entities - at the level of linguistic "performance." According to Pariente, under such circumstances, eventually some more satisfactory linguistic theory should be devised (Pariente, p. 282).

The logical status of epistemic entities

Furthermore, depending upon the viewpoint adopted, epistemic entities can be said to have two different logical positions. Indeed, when considered from a certain perspective, epistemic entities form individualities, different from other individualities within the same system. For instance, within the phonological system of French language, the phoneme /b/ is an epistemic entity - an individuality - different from another epistemic entity, /p/ - another individuality.

However, from another perspective, the same phonemes /p/ and /b/ can also be considered as classes that correspond to many different empirical objects: for instance, the phoneme /b/ represents the class of all empirical phonemes, that is, of all phonetic realizations of the sound [b] (obviously, within its own space of differentiation).

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In other words, the fact of being either an individuality and/or a class cannot be an intrinsic property of an entity. It can only be a formal property, given to an object through a scientific language (Pariente, pp. 270-273).

A MODEL AS THE JUNCTION-POINT OF THEORY AND EMPIRICAL DATA

Examined from a different angle, a model can also be conceived as the junction-point of a theory and some empirical data (Pariente, p. 276). In order to be effective, the intersection of these procedures must be accomplished by means of operators of individuation. Thanks to operators, universal relations can correspond to individual features, selected among the relevant features of the object under investigation, as it was illustrated with Walter's phonological analysis of a particular idiolect.

It follows that a model can be said to be at the intermediary level between a theory (or theories) involved, and some empirical individuality, that is, between universal laws or principles, and some empirical data:

T - M - I

(T = theory; M = model; I = empirical individuality)

In order to scientifically capture individuals in their singularity, a model must be devised. If such is the research goal, the object studied must not be reduced to a concept valid for all individuals belonging to the same pre-determined class, as it is the case with knowledge by system (Pariente, p. 223).

Theory and Model

The relationship between a model and a theory is obviously a very complex issue. Within Pariente's perspective, it must be understood that models can be elaborated only within some theory: "A model is not a model in itself and by itself, but in relation to some theory" ["Le modèle n'est pas modèle en et par soi, mais relativement à une certaine théorie"] (Pariente, p. 279).

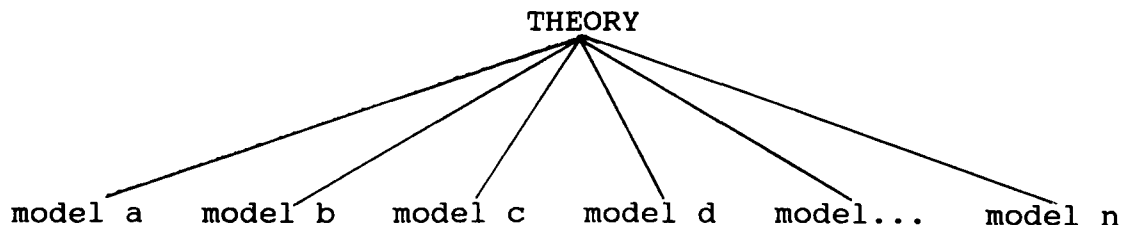
A THEORY AS A MATRIX OF MODELS

In order to apprehend individualities, a theory must be conceived

as a matrix of models, a set of classes and relations from which it is possible to elaborate systematically the models which correspond to the different individualities to be known. (Pariente, p. 289)

(une matrice de modèles, un ensemble de classes et de relations à partir desquelles il est possible de construire méthodiquement les modèles correspondants aux différentes individualités qu'on se propose de connaître.)

In other words, a theory must give rise to a multiplicity of models, according to the particular objects involved, as illustrated by the following schema:



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For instance, within Martinet's functional linguistic theory, many models can be devised: for the description of French-Canadian phonology, for the description of any language (from Europe, Africa, etc.), for the description of dialects (for instance, "Franco-provençal" dialect, in Southern France), etc. In order to apprehend some individuality, a theory, which encompasses three articulated sets (a set of classes, a set of relations among elements of these classes, and a set of operators of individuation) must allow the elaboration of more than only one model.

THEORY, MODEL, AND SCIENTIFIC PROGRESS

In this connection, such a conception of a model allows a better understanding of scientific progress. Indeed, it seems possible to define the conditions in which a scientific theory is substituted for a previous one. In order to be replaced, a theory must appear incomplete, that is, in Pariente's terminology, be unable to elaborate the model of some empirical individuality (Pariente, p. 278). For example, the classical theory in political economy was unable, according to Keynes, to explain unintentional unemployment: such a theory was not false, but only limited to some individualities. Another case reported by Pariente is Galbraith's refusal to explain modern economy by the principle of the market, based on profit, because such a principle cannot explain the functioning of important industrial enterprises. In

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the case of Martinet's functional linguistic theory, the status of intonation is a major problem. He considers intonation as "linguistically marginal," which is a very controversial position (1962, p. 38). Whatever the case may be, in general a new theory, claims Pariente, must have a wider capacity to construct models, that is, to encompass more facts than previous theories (p. 279).

In this chapter, Pariente's conception of theory and model, and their relationships, was scrutinized. A theory is considered as an essential ingredient of scientific knowledge, playing a crucial role at every step in the process of individuation: to sort out relevant and non relevant variables, to select object-features and factor-features, to identify operators of individuation, to construct epistemic individuality and to relate empirical and epistemic individualities. According to Pariente, a theory encompasses a set of classes, a set of relations between classes, and a set of operators of individuation. It was shown that the elaboration of different types of operators of individuation involved in the scientific knowledge is based on a principle of double autonomy: an autonomy of language, and an autonomy of discipline. In knowledge by system, a theory acts as a process of discovery; in knowledge by model, it acts as a process of invention. It was also mentioned that knowledge by system should not be seen as a failure to capture an individual. The type of knowledge involved varies according to the research

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goal: to classify some individuality as an element of a class, or to identify its singularity. Furthermore, Jakobson and Walter's research illustrated the complementary nature of both types of knowledge, one type being possibly based upon the results of the other. Only knowledge by model can give rise to a genuine knowledge of an individual qua individual, that is, knowledge of an individual in its singularity.

As far as a model is concerned, characteristics of Pariente's conception were presented, with its internal duality: a represented, and a representer. From a certain point of view, a model is conceived as the set of intelligible relationships between empirical and epistemic individualities. From another perspective, a model is considered as the junction-point of a theory and empirical data. In order to capture individualities, a theory must be conceived as a matrix of models. It results that in order to be replaced a theory must appear incomplete. A new theory must show a wider capacity to construct models characterized by their ability to encompass more empirical facts than the previous one.

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In the present work, following Granger's suggestion, it was assumed right from the outset that the study of education, like any other social discipline (such as linguistics, psychology, sociology, etc.), can be characterized as a domain of applied knowledge. Within such a perspective, the study of education can steer clear of the horns of the epistemological dilemma of individuality. When a science addresses a practice, claims Granger, it necessarily deals with individualities. However, as long as a discipline is conceived as a speculative science, Aristotle's aphorism remains true: the only valid type of scientific knowledge is of the universal.

Addressing a practice - and therefore dealing with individualities - the study of education was considered as a domain of applied knowledge. Therefore the status presently given to individualities in the two broad perspectives of the study of education (curriculum studies, and the study of teaching) had to be examined in order to see to what extent some knowledge of the individual can effectively be achieved.

CONCLUSION

Research Goals

In general, four different research goals have been identified in the current practice of research in the study of education. In the practical approach, the research goal is to take concrete decisions or actions in order to solve practical problems. In the nomothetic approach, which draws its basic assumptions from the sociological empiricist tradition and takes the natural sciences as its model, the research goal is to discover laws, mostly under the form of statistical generalizations. In the idiographic approach, which imports its basic assumptions from the sociological rationalist tradition and believes there is a fundamental distinction between the nature of the natural sciences and of the social (or human) sciences, the research goal is to give some interpretive understanding of the meaning of actions from the point of view of the actors involved. In the taxonomic approach, the research goal is to classify an element as a member of a predetermined class or conjunction of classes.

These four research goals of scientific inquiry, currently involved in educational research, could be summarized under the form of the following schema:

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APPROACH	RESEARCH GOAL
- the practical approach:	to take decisions or actions
- the nomothetic approach:	to discover laws
- the idiographic approach:	to understand the meaning- perspective of participants
- the taxonomic approach:	to classify an element as a member of a predetermined class

Taking into account these research goals, insofar as the status of individuality is concerned, two broad attitudes have been observed. On the one hand, within the nomothetic research tradition, individualities are neglected. It is understandable since, as it was previously mentioned, the goal assigned to educational research is to discover regularities or universal tendencies. On the other hand, in other approaches the individual is given some attention. In the practical approach, the individual is conceived as an object of decision or action: however, it is not considered as an object of knowledge. In the idiographic approach, the individual is seen as an object of understanding, under the form of the meaning-perspective of the participants involved: here again, the individual is not considered as an object of knowledge. In the taxonomic approach, the individual is considered as an object of classification, which is a form of knowledge. Indeed, as seen in the previous chapters, every knowledge implies a principle of classification.

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In this sense, the taxonomic approach is interesting insofar as knowledge of the individual is concerned but such a type of knowledge - knowledge by system - has its own limitations. It gives information as to which class the individual belongs to. However, the individual is never known in its singularity, that is, in what makes this individual different from all the other individuals.

Towards a Genuine Knowledge of the Individual

In the present state of educational research, there seems to be no type of investigation which leads to a genuine knowledge of the individual. However, such a type of knowledge seems not only desirable, but achievable: in some disciplines, such as it was illustrated with the case of the Leyden jar, the Rorschach test, and Walter's phonological study of idiolects, some genuine knowledge of the individual is achieved. And the process involved in these cases was carefully examined within Pariente's philosophy and led to the conclusion that a theory and a model were necessarily involved, and that some links had to be made between an empirical individuality and an epistemic individuality (by means of a model within a theory). Such a type of knowledge - knowledge by model - which achieves a genuine knowledge of the individual, was named the idiologic approach.

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Knowledge achieved within the idiologic approach is a genuine knowledge of the individual in the following sense: the singularity of the individual under investigation is constructed in order to determine what makes such an individual different from all the others, and some explanation of its singularity is given by means of the factor-features involved. In other words, if an individual is this individual (and not this other one), it is because it possesses some particular factor-features. As seen in previous chapters, in the process of individuation it is precisely the role of a theory and a model, by means of operators of individuation, to discover such factor-features which lead to the construction of an epistemic individuality.

As seen previously with Pariente's conception, in order to deal properly with knowledge of individualities, it is necessary to move from an empirical individuality to an epistemic individuality, through the intermediary step of a puzzling individuality. With factors identified by the theory as factor-features, a particular object or phenomenon is related to general or universal principles through the theory and the model involved. While empirical individuality is an object of experience, epistemic individuality is an object of knowledge. In order to explain an object-feature (the explanandum), factor-features (the explanans) must be assigned a position within a certain space of differentiation as defined by the theory and the model devised. The theory acts as an invention procedure (it

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acts as a discovery procedure with knowledge by system). In other words, by a process of transformation from one type of individuality to another, a link must be made between the practical and the theoretical, contrary to Schwab's belief. And a model consists of the set of intelligible relationships between empirical and epistemic individualities.

However, it must be stressed that factor-features identified by a theory and a model are necessarily of a universal nature. It must be remembered that when a position is assigned to a factor-feature within a space of differentiation, such a factor-feature is identified with an operator of individuation. Furthermore, an operator of individuation is a scientific concept which makes the necessary links between some universal law or principle and a particular variable. However, in the present state of development of the study of education - which is still an emerging discipline in its infancy stage - there seems to be no theory or model which could lead to a knowledge of the individual qua individual. Within a formal conception of individuality, individualities involved are not empirical but epistemic individualities which are the result of an intellectual construct (based upon empirical individualities).

At this point, it must be remembered that knowledge by system and knowledge by model should not be conceived as two forms of knowledge with no possible links between them. For instance, on

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one hand Jakobson's phonological features, identified as representative of knowledge by system, were taken as a point of departure by Chomsky and Halle who developed a theory which could be conceived as an illustration of knowledge by model. On the other hand, the results of Walter's phonological study of idiolects will eventually be used as a basis of a study which can be characterized as leading to knowledge by system.

In this respect, in the domain of educational research, it seems that some of the results achieved within the nomothetic research tradition could make some contribution to the development of knowledge by model, within the idiologic approach. In the nomothetic approach, the research goal consists of statistical generalizations across various individuals and settings. The idea suggested here is that statistical generalizations could eventually be used as general, cultural or universal tendencies, which are essential in the process of knowledge by model. In other words, some general tendencies empirically identified within the nomothetic research tradition could be used as factor-features to explain some object-feature involved in empirical individualities under investigation.

Within the idiologic approach, some conceptual universe must be devised and articulated with the universe of the individuals involved in education. As the idiologic approach necessarily takes general tendencies into account, mainly under the form of

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factor-features and operators of individuation, it avoids the difficulty inherent in the idiographic approach, that is, the lack of generalizability of its findings. While the idiographic research tradition could legitimately be seen as a hypothesis-generating undertaking useful for the nomothetic approach, the nomothetic approach in its turn could be legitimately seen as a statistical generalization undertaking useful for the idiologic approach, as far as knowledge of the individual is concerned. In this sense, approaches in the study of education are complementary. For instance, the idiologic approach could investigate data which are usually ignored by the nomothetic research tradition, as they do not fit a given generalization. Using Pariente's terminology, these data could be considered as puzzling individualities which deserve to be examined. The point of comparison would be precisely these given generalizations into which these entities do not seem to fit.

The goal of the present investigation was to spell out the epistemological assumptions underlying the issue of individuation within the social sciences in order to examine conditions for the achievement of a genuine knowledge of the individual in education. The result is that, in fact, some genuine knowledge of the individual is not only desirable but achievable, with knowledge by model (which implies the existence of a theory with its model, etc.), at least in the area of linguistics. In the study of

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education there is no theory devised to intellectually capture the individual qua individual. Under the circumstances, it seems necessary to make reference to the results - general or cultural trends, or statistical generalizations - already achieved within the nomothetic research tradition. Such is a necessary step in order to go through the necessary stage of trans-individual concepts by means of factor-features and operators of individuation in order to achieve some genuine knowledge of the individual.

In this sense, the issue raised by Plato (and mentioned in the first chapter) according to whom the only genuine knowledge achievable is knowledge of permanent, eternal and changeless entities, seems to be only partially true. When dealing with speculative sciences, Plato's claim seems to be true. However, when dealing with applied knowledge, contrary to Plato's belief some genuine knowledge of the particular seems also achievable, as it was illustrated in the present study on a few cases.

As the study of education was considered primarily as a domain of applied knowledge, some genuine knowledge of educational individualities seems achievable. Clearly, any research goal could be debated. However, if it is assumed that knowledge must precede decision or action, there is a great interest to undertake the study of educational individualities in order to take sound and well-informed decisions and actions. In other words, genuine

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knowledge of the individual seems to be a very legitimate and realistic goal to be assigned to research in the study of education. Under the circumstances, going against the major tendencies in contemporary educational research which overlooks theory,* and contrary to Schwab's conception, the importance of "recalibrating" educational research towards the theoretical appears as an urgent necessity if some genuine knowledge of the individual is to be achieved in the study of education.

* In this connection, it must be mentioned that the term "theory" does not even appear in the Index of the recent Handbook of Research on Teaching (1986).

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* By convention, every title in an abridged form enclosed in square brackets (at the end of a title) corresponds to the abridged form given in the text.

In addition, the first date given, preceded by lowercase c, indicates the first date of the copyright, and the second one indicates the date of the edition used here.

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