

Ways of Knowing: Comparing World Views and Methodologies

All Day—Monday, April 29, 1985

Bodek Lounge, Houston Hall

The Point Of It All . . .

Edward Peters
History/SAS
Chairman, Liberal Studies Graduate Group

Universities exist, so they say—and so it is said about them except by cranks and Secretaries of Education—to preserve, extend, and disseminate human knowledge. They do this by the principles of division of labor and discipline: different kinds of knowledge are preserved, extended, and disseminated by different people in different schools with different levels of instruction. It is all based on a more or less sophisticated—and in any case elaborate—classification of subject matter and methodology (and epistemology) according to discipline. Except for individuals and institutions that take empiricism or revelation a little too seriously, universities profess to be the preservers, extenders, and disseminators of knowledge, and everybody nods and ponders that this is probably so.

It is. But it presents problems. By classifying, dividing, stratifying, and otherwise spatially, schematically, budgetarily, and metaphorically splitting up knowledge in order to make it more digestible and less intractable, even universities find they can't quite put their monumental fingers on it when they want it or when someone asks for it. Moreover, the very method of handling knowledge invites workers in the micro-vineyards toward a kind of epistemological solipsism—my knowledge, not to mention its *discours*—is, if not quite universal, then certainly more than adequate for any of life's littler and bigger problems. This is not true, but the sentiment is understandable.

Since we happen to have a university handy, it seems like a good idea to try, not to assemble and display and rejoice over *all* knowledge, but at least to raise questions about the relations among different kinds of knowledge—or ways of knowing—and about different kinds of Knowledge with a capital K.

The papers presented on the following pages are meant to get us started . . .

For Conference information, call
Nancy Bauer, Director, 898-6967.



The Schedule . . .

8:30-9:00	Continental Breakfast
9:00-10:00	Session 1: The Right to Know—In whose interest do we acquire knowledge? Edward Peters—History/SAS Ivar Berg—Sociology/SAS
10:00-10:15	Coffee, Tea and Danish
10:15-11:15	Session 2: Technology Policy: Decision-Making and History—What methodologies inform technology decision-making? Thomas Hughes—History & Sociology of Science/SAS James Emery—Decision Sciences/Wharton
11:15-11:30	Cider and Donuts
11:30-12:30	Session 3: Knowing the Future—Can it be shaped? George Rochberg—Music/SAS Aron Katsenelinboigen—Social Systems Sciences/Wharton Jean Alter—Romance Languages/SAS
12:30-1:00	Sandwiches, Coffee and Soda
1:00-2:00	Session 4: Micro vs. Macro: Theories as Models of Reality—Can models reflect truth? F. Gerard Adams—Economics and Finance/SAS & Wharton Louis Girifalco—Materials Science and Engineering/SEAS
2:00-2:15	Sandwiches, Coffee and Soda
2:15-3:15	Session 5: Credentials and Credibility—What are valid uses of knowledge and by whom? Nancy Bauer—Education and Graduate Professional Development/GSE & SAS Paul Korshin—English/SAS
3:15-3:30	Cider and Donuts
3:30-4:30	Session 6: Matters of Life and Death—How do the values of disciplines and professions shape views of life and death? Nathan Sivin—History & Sociology of Science/SAS Renée Fox—Sociology/SAS

Sponsored by the Liberal Studies Graduate Group

The conference is sponsored at Penn by the Liberal Studies Graduate Group—research professors from across schools and departments who work together and with others in evening and Saturday graduate seminars to address questions and issues of importance across disciplines. These seminars and the Master of Science degree are offered by the Liberal Studies

Graduate Group as the Graduate Professional Development Program. The central theme of the program and its post M.S. degree Fellows in Applied Research program is the relationship of differing values and different methods of research in approaching assumptions and practices in the management of organizations.

The Right to Know—

In whose interest do we acquire knowledge?

Ivar Berg
Sociology/SAS

We acquire knowledge in the interests of those who seek to "live examined lives"—their own and the lives of those who endowed the world's cultures, East, West, North and South, with their arts, religions, sciences, traditions, beliefs, hopes and values not less than with their superstitions, prejudices, and reductionistic metaphors.

We acquire knowledge in the interest of understanding the ways of governed peoples, the capacities of those who would govern them, and the political and philosophical systems that best limit these larger and smaller numbers from using each other to ends that are oppressive of personal liberty, the free exchange of reasoned opinions and of justice. We acquire knowledge to make students and readers "safe for ideas" and to minimize risks that, otherwise, ideas would need to be "made safe" for students and readers.

Next, we acquire knowledge in order that we can learn to use nature's forces without abusing them (and to understand the difference); that we can learn how to serve those who are living out their seniority, care for those whose lives are in peril; and that we can learn to afford them the sustenance that enables the younger and middle-aged among the rest of us to make both what is "useful and ornamental." We acquire knowledge so that there will be respect for those who sentimentalize and moralize not less than for those who aspire to help us discover the most efficient means to the realization of unexamined ends.

We acquire knowledge, finally, because to live without learning or without the equipment for learning is to live in a long dark tunnel and to be ignorant of the glories and frustrations of identifying moral, aesthetic and political judgments.

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Edward Peters
History/SAS

The Martial Arts and Sciences

Since the eighteenth century the western world has identified both a fulfilled human nature and the discovery of truth with the unfettered play of the mind, and it has formalized this identification in—among others—the terms "intellectual freedom" and "academic freedom." We have praised the manifestations of these in the past, and worry consistently about their future. Yet this idea and its current and recent manifestations—arts and sciences curricula in colleges and universities, extensive funds for research provided by apparently disinterested sources, the notion (whatever it currently is) of a "civilized" human being—are all relatively recent acquisitions of western society. They have not always been so defined and admired, nor are they now so defined and admired elsewhere.

Although we might dismiss the question of this opening session with the answer that we have the right to know because the knowledge is there to be discovered and that we acquire knowledge in its own—and therefore in our own—interest, such answers are what Germans call *zeitbedingt*—time-bound, and, if historical study tells us nothing else, it tells us that what Time giveth, Time can also take away.

Once we finish praising the Greeks for having given us unlimited intellectual curiosity, we must also remind ourselves that a great many Greeks and Romans, for different reasons, lacked a word for intellectual curiosity and powerfully criticized that same hunger for knowledge that we praise other Greeks and Romans for having invented. Once we praise Judaism and Christianity for having insisted upon a spiritual dimension to human nature that we have always and properly cherished, we must also remember the strict lines both faiths laid down regarding not only what it was proper and improper to know, but the relative virtuousness of the passionate intensity with which we do that pursuing.

Once we praise the scientific revolution and the political reorganization of early modern and modern society that have enabled us to institutionalize and legalize the pursuit of knowledge, we must face up to the normative, epistemological, and self-interested criteria with which the descendants of those societies manage the search for knowledge.

For we have another kind of investment in the unlimited right to seek knowledge—we have identified the essence of our historical identity with it. It is our tradition, and its institutions and epistemological agencies are the ways we have chosen to preserve and communicate it, if not to other cultures, then at least to the next avatar of our own, later generations.

This is a perilous investment, because much knowledge and the ways of acquiring and classifying it are under furious attack on many fronts: the new information order being discussed in UNESCO, the limitations on distributional requirements from many fronts, the attacks on "secular humanism" and other targets, the argument that technology explains all, and the subtler varieties of information science and the explicitly normative expectations of the world of learning, training, and work. They all intimate that our own present ideas about the organization of knowledge, its discovery, and its transmission may be much more fragile than we thought and that the liberal arts and sciences had perhaps better be cultivated in a more martial spirit than has been customary with us.

In a world of disinformation, of opinion shaped more than researched, and of pleasant mandarin specialization without thought to the conditions that make it possible, we may not have to send to see for whom the epistemological bell tolls. We have met the tollees, to paraphrase Pogo—an unhappily extinct species of possum—and they is us.

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Technology Policy: Decision-Making and History— What methodologies inform technology decision-making?

Thomas Hughes
History & Sociology of Science/SAS

Is it worthwhile for engineers, managers, and other decision makers who affect technology policy to read the history of technology? If the need is for a formula or extrapolation that would permit prediction, then the answer is no. Most historians do not avoid prediction out of intellectual timidity or lack of imagination, but from an awareness of, and preoccupation with, contingency in history. There are many events and trends that can be projected—such as sunrises, sunsets, bureaucratic behavior, and the marches of lemmings, but historians leave these matters to positivistic social scientists. Instead, most historians offer wisdom in their insistence that decisions must be made and life must be led in a projected state of uncertainty. Not even the most extreme technocrats with their mechanisms and systems can drive out all life from the planet.

If historians offer knowledge of contingency and the promise of uncertainty, then having heard this, why should the decision maker read on? Reasons include the historians' analogies and their awareness of the peculiar burden of history. While historians tend to avoid discourses on predictable bureaucratic and machine operations, they are interested in those occasions when, for instance, bureaucratic routine and large technological systems break down. They consider the circumstances under which this occurs. By describing the factors, groups, individuals, and events associated with the unpredictable, historians provide one side in an analogy relationship, and the decision maker, aware of past situations, can examine present circumstances and supply the other side of the may-be-analogous-to statement. Then, the decision maker will probably formulate better hypotheses about what might happen. For instance, there are, in history, innumerable cases of the breakdown of technological systems when designers have assumed that humans will perform—if well fed, untrusted, and not short-circuited—like non-human components in a technological system. The history-wise decision maker will scan his horizon of responsibility of analogous assumptions and situations today.

The decision maker should also become wise about the burden of history, including the history of technology. Historians show that there is not one best solution for a problem, but a particular solution for contingent circumstances, including time and place. With the passage of time and the change of place, technology (hardware) survives as an anachronism. The explanation for things as they are often involves causes forgotten by engineers and managers, but remembered by historians. The wise decision maker will make allowances for old technology fading away as slowly as old politics.

James Emery
Decision Sciences/Wharton

We are continually faced with enormously complex problems that involve, at least in part, difficult technical issues. How do we deal with our long-run needs, our pollution problems, missile defense, urban congestion, and an aging population? These are just a few of the problems we must cope with through this decade and on into the next century.

Decision models have been applied to these and a host of other kinds of important problems. The attempt in developing such a model is to try to better understand the problem by identifying the decisions that must be made (e.g., what restrictions should be placed on pollution), the objectives we seek (e.g., reduce pollution-related costs), and the relationships among the important variables involved in the problem (e.g., the amount of sulfur dioxide produced per ton of coal burned). The value of such a model comes from the aid it can provide in giving policy makers estimates of the consequences of alternative policies. Even if it is short in its ability to provide accurate predictions, it can often at least provide useful insights about the problem and serve as a vehicle for communication among the various stakeholders.

Such models have a blemished history. They inevitably are imperfect representations of reality. They make assumptions that prove wide of the mark. They are difficult to verify and interpret. They may stir things up by explicitly recognizing issues and relationships that might better be left unstated.

But what are the alternatives to coping with the intrinsic complexities that we face in the modern world? As imperfect as it may be, a model can still overcome some of the limitations that the unaided decision maker faces in dealing with complex problems. Computer-based "decision support systems" can help the decision maker sift through mountains of data to try and make some sense of what's going on.

A great deal of effort is being directed at making these decision aids more effective. Some of the important work is directed at making the systems more adaptive, friendly, and "intelligent." We have a long way to go, and no one in his right mind would argue that many of the world's problems can be solved through rational analysis and modelling. Nevertheless, this approach to problem solving, when properly applied, can make some very useful contributions.

Knowing the Future— Can it be shaped?

George Rochberg
Music/SAS

(Excerpts from Chapter One, *The Aesthetics of Survival*, 1984)

Human consciousness and thought in the twentieth century have discovered the essential irrationality of the premises on which they are based. That the old world of illusory certainties has disintegrated in the face of new conditions which govern contemporary existence is acknowledged by all who are seriously concerned with man's destiny, including the physicist, the theologian, and the philosopher. The falling away of values founded on the illusion of rationalistic certainty has left man exposed both to the waywardness of his own nature and to that of the universe around him. Man can predict nothing today except on the basis of statistical probability and this brings him little comfort in his new and painful awareness of his condition. This is the time when, according to Zen Buddhism, "mountains no longer look like mountains, and rivers no longer look like rivers" . . .

If man's reason is the true measure of reason, ours is a nonrational world. Still there are those who must have certainty in order to act, any certainty that seems to ensure the possibility of a rational order. In their haste to seize upon rational certainty, the first thing they sacrifice is subjective freedom, because it is this possibility of inner freedom, now deprived of its supporting buttresses, which is so painful to bear. Not only are we surfeited with political examples of this, in both Communist and Fascist states where freedom of the individual is sacrificed to power, bread, and security; we see evidence of an analogous kind in the divorce of subjective freedom from objective rational standards in twentieth-century art.

In music, this divorce between the human affections—subjectivity—and the operations of reason is fully revealed in the works which have been recently issued under the slogan of "total organization"—a completely rationalized system of serial composition which, so its practitioners mistakenly believe, leave nothing to chance. On the other hand, in an attempt to make unpredictability itself a principle of composition, there are those who, like John Cage, compose "chance" music. In the one case, indeterminacy enters by the back door, disturbing the careful microcosmic calculations of the composers and upsetting their "systematic household." In the other, indeterminacy is the root principle; but because it, too, proclaims a personal detachment from what will happen, the doctrine of "chance" music is incapable of entering into the subjective human world as is the doctrine of "total organization" . . .

The term indeterminacy suggests words like indefinite, vague, and nonspecific. Its implied tendency to formlessness would seem to contradict the extraordinary degree of self-avowed objectivity and

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Knowing the Future— continued

George Rochberg, continued

rational control characteristic of the work of Boulez, Stockhausen, Nono, and others, that is based upon the principles of total organization—serialism pushed to its furthest limits and investing every aspect of composition with a predetermined mathematical certainty. The question arises: How can a total serial approach to composition, so rigorously systematized, result in "indeterminacy"? Isn't there something wrong with the equation? And if such an approach to composition does produce an effect of "indeterminacy," how does this contradiction between the technical means employed and the musical results achieved come about? Are there hidden factors which must be elicited to resolve the paradox? If so, what are they? . . .

But we are involved once again in a paradox; this time as a result of the traditionally macrocosmically oriented past with the new microcosmically oriented present. Intuition is a nonrational faculty of man. Through intuition, we suddenly know something or see relationships existing between phenomena where previously it seemed none existed. Man proceeds as much by his intuition as by his reason, and when intuition is guided by reason we have the wedding of man's two great potential resources for acting from within himself and the world around him. The new paradox then is this: In those eras dominated by the macrocosmic view of music, composers operated intuitively, using their reason only as a controlling guide. Because the expanding vocabulary of the eighteenth and nineteenth centuries was the result of a continuous cultural process, composers did not have to rationalize every stage of this process. The constant interplay of intuition and reason, subjective projection and objective purpose, produced the clearest, most sharply defined determinate shapes we know in music, including those of Webern. In the new music, intuition—representing subjectivity, the nonrational in man—having been rejected as an unwelcome intruder, has had its revenge by returning as indeterminacy. Though largely intuitive, the melodies of the old music are articulated through clear patterns of pulsation and beat; though completely rational, the objective sound-structures of the new music lacked the rhythmic clarity which pulsation and beat provide, and are paralyzed into formlessness through beat suspension. . . .

We shall first have to learn to be certain of the uncertain, to feel and to love where there is no apparent reason to feel and love, to live and act because living and acting are all that human beings are capable of. The composer is no more exempt from this than any other creative artist. This is the condition of our subjective freedom—now stripped of the old value forms—and therefore the material of our art and music.

Aron Katsenelinboigen Social Systems Sciences/Wharton

(Excerpts from a longer paper available upon request)

The existing approach to determinism is mainly confused with other phenomena. It is based on the one hand on the assumption of the existence of a full set of causes, and on the other hand assumes that the situation is certain, it does not have a degree of freedom, and the relations between the input and outputs are realized like a law (a reflex), i.e., by input influence. Indeterminism is opposed to determinism and is linked on the one hand to the absence of a full set of causes and on the other hand to uncertainty, freedom and teleology. . . .

Very often the answer to the question of the degree of indeterminacy appears in the form of probabilities; but this is ambiguous. First of all, probabilities can reduce indeterminacy to uncertainty. I do not mind the measurement of indeterminacy by probabilities; I do, however, object to the reduction of the whole problem of indeterminacy to the probability of the appearance of an event. . . .

My approach to the concept of indeterminism is based on the introduction in the twentieth century of a "program" as an object. Programs for computers, genetic codes, and for technology for mass production can serve as examples of such objects. One can recognize programs of different levels, i.e., programs for the creation of programs are programs of the second level. Our following discussion will concern a program of any level but keeping in mind that the solution of the problem of indeterminism vs. determinism [to what extent can human beings really shape the future] requires the analysis of the whole set of programs of different levels.

The level of completeness of a program stipulates the degree of indeterminacy. The completeness of a program in its turn is recognized by the degree of "free space" which the program has for changes . . . my approach to indeterminism is based on the introduction of a new dimension which deals with the degree of potentiating . . . [by which] I mean the preparation of a potential, i.e., a structure of a system's state which induces the system to develop in a "desirable" direction, and simultaneously the potential prepares the system to absorb favorable, unexpected outcomes in the unknown future and to avoid undesirable ones.

The critical point of a potential from a structural point of view is the introduction of relations as independent variables along with input-output ingredients. I mean by relations in this case "structural" ones, "relation of an entity toward the whole," i.e., when the location of one object is changed it does not change the locations of the others. . . .

All the variables which form a potential, i.e., the input-output ingredients and relations, have to be linked either by functional relations or "evaluated," i.e., have to have beyond them the forces which attract/repulse them in a certain direction and a certain distance.

From the point of view of a process, potentiating takes from the past the direction for development, the correlations between ingredients, relations between the ingredients and the "evaluation" for these relations, as the techniques which change the techniques for performance, and in particular on the basis of accumulated new information.

It seems to me that the given concept of indeterminism-determinism had both an epistemological and ontological meaning. This concept is relevant as to the process of thinking by human beings, as to the "artifacts" (and to the field of artificial intelligence, in particular) and eventually to the human beings' vision of the mechanisms of the performance of different natural systems from the physical realm and ending with living beings. . . .

Chess can be of special interest in the area of our present concern for the following reasons (Shannon 1950). Its major point of interest lies in the fact that it is impossible, except in a game between two novices (the "fool's mate"), to relate one's opening moves to the game's final goal. . . . This gives rise to the problem of formulating intermediate objectives which ultimately should lead to the best possible outcome. . . .

The concept of indeterminism could be implied to other artificial systems created by human beings, and first of all to economic systems. The existing economic theory can be treated mainly as a deterministic concept. The deviations from this concept which have been made by several economists are sporadic and nonconceptualized. . . . That is why they have many deficiencies: a limited list of relations, the absence of methodology of evaluating these parameters, etc. and unsolved problems like the selection of constant prices for input-outputs. As a result of this it is not clear who and under which conditions can use the new techniques. . . .

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Knowing the Future— continued

Jean Alter
Romance Languages/SAS

Our total Representation of reality is never totally complete, nor integrated. In semiotic terms, our knowledge of reality is stored, in the form of networks of representational signs, in our memory. It is based on direct experiences, deposited in memory as discontinued representations, and is supplemented by information received already through signs (language, pictures, etc.). Through various processes, such as causality or associations, these representations agglomerate to form discrete sequences or larger networks, not necessarily connected.

Following Piaget's hypothesis, I am postulating that the creation of this Representation is self-regulated by two genetic factors of human intelligence: 1) That each new event is related to the existing structure of networks by dint of a structuring drive, and 2) That, when conflicts or contradictions occur, a well self-regulated Representation carries out the required re-structuring. However, while structuring is a natural and pleasurable activity (as is the satisfaction of the sex drive), re-structuring requires spending additional energy, and hence tends to be avoided, especially when existing structures are adequate to handle reality and are relatively rigid. In these cases, the structuring drive is satisfied by play-structuring, i.e., games, which by definition do not require any re-structuring of the Representation of reality.

Within this admittedly mechanistic perspective, any idea (representation) of the future consists of a change within the Representation brought about by a new information, in the form of a possible new configuration of a network, or a new association between networks or parts thereof. Even the most rigid Representations (with game-dysfunction) allow for a future projection when the event neither conflicts with, nor calls for associations with, existing networks: this is the case with most deterministic or causal expansions and projections of "specialized" knowledge. However, any "creative" vision of the future does require new association, with potential need for re-structuring, i.e., a smooth operation of self-regulation. A game-dysfunctional Representation will then shun such an activity, or will not be able to carry it out. One exception to this constraint and rigidity may be the field of arts, which by many can be taken to be games, i.e., not needing re-structuring. For the serious artist, however, artistic creation is a serious matter, with its own reality, and hence is comparable to a general projection of future possibilities.

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Micro vs. Macro: Theories as Models of Reality— Can models reflect truth?

Louis Girifalco
Materials Science & Engineering/SEAS

A model is an abstract mental construct designed to describe some limited portion of reality. It consists of definitions of a set of entities, definitions of their properties and rules for constructing relations among them. In its present form, a model is an axiomatic system, similar to geometry, and its degree of validity is determined by the degree to which its deduced consequences agree with observation.

The validity of models depends on the extent to which they can incorporate the essential features of the systems they describe. The kinetic theory of gases, for example, is valid and very useful because it incorporates the concepts that determine the real properties of gases consistently and reproducibly. Econometrics, on the other hand, is based on models that are necessarily incomplete because the economy is very complex and human behavior is not always predictable.

Models are important for rational thought about reality because our minds manipulate symbols and not real things. The role of models in trying to understand the world can hardly be overestimated. They provide frameworks within which to organize our thinking; they provide vocabulary and logical structures that aid communication; and they provide criteria that help us judge whether or not statements are correct. A major function of models is to point us towards a deeper understanding and a more accurate representation of reality, particularly when the model is partially unsuccessful.

While models are necessary and useful, they must be applied and interpreted with care. There is always a danger of being captured by our mental constructs, thereby slowing the growth of understanding and tempting us to use models in circumstances that make them invalid. There is always a natural tendency to extend models beyond their bounds of validity and this is particularly true for models of very complex systems for which measurement and observation are difficult.

Successful model making is an evolutionary process in which a model is continually refined and extended to include more and more aspects of the real situation through an iterative process that continually checks the model against observation and measurement. A successful model can then ultimately describe a system in considerable detail from a base of deep, far reaching assumptions. It might then be called a theory, with some claim of correctly describing reality. It must always be kept in mind, however, that correctness in this regard means agreement with observation and "truth" denotes an isomorphism between the structure of the model and the structure of the observations.

F. Gerard Adams
Economics & Finance/SAS & Wharton

The Challenge

The challenge of economics lies in its immediacy and reality. We live in an economic world, we track the statistics of this world every quarter in the national income and product data, indeed every day in the exchange rate, stock market, interest rate figures. We are all personally involved in this economy through the incomes we receive and the prices we pay. We have a voice in its management through the political decision making process. And many of us think, rightly or wrongly, that we know a good deal about how the economy functions.

Yet, the economic world is immensely complex and difficult to study. In contrast to the behavior of atoms in physics, the behavior of economic agents is neither automatic nor invariant. For example, consumers make choices seeking, within the constraints of available income, to achieve the best possible living standard. And consumers are aware, they learn from past experience.

In economics as in other fields, models have been a means to simplify the real world to make it intellectually tractable. And theoretical simplifications have made enormous contributions to our understanding of the economy and of how it works. They have served as the basis not only for describing the economy but also of prescribing for it normative statements about what ought to be and how to achieve it. But one of the difficulties is how to test these models, how to confront the neat relatively straightforward model of the theorist with the complex, rough, and frequently dirty information about the real world? How to test the theories in a world where the experiments of natural science are not possible and where constant cause and effect relationships cannot always be assumed?

Econometrics and Models

Econometrics represents the confrontation of theory with reality in economics, until recently a unique case in the social sciences. It represents the application of the scientific model to economics.

Econometrics has been a way of testing theoretical economic hypotheses. Theoretical ideas have been given quantitative dimensions. Statistical means have served to provide the *ceteris paribus* assumptions of experimental sciences. The propositions of theory have been confronted with empirical fact, they have been tested, modified, and tested again. The econometric model is the final outcome of this process, a descriptive tool bringing together theory and empirical information which can be used for conditional forecasting and for simulation of alternative policies.

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Micro vs. Macro— continued

F. Gerard Adams,
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Micro and Macro in Econometrics

As in other fields, models are simplifications of reality. They are purposive tools. The models may represent macro phenomena in economics, relationships between aggregates like consumption and income. But the underlying theories of the behavior of the economic agents are largely at the micro level, the behavior of individual consumers, for example. The linkage between macro relationships and the underlying micro behavior has concerned economists for many years. What is the micro basis of macro behavior? Under what circumstances will the responses observed at the macro level, between economic aggregates, correspond to the real behavior of individual consumers? Many of the controversies in contemporary economic theory reflect on questions of micro versus macro. And many claim that the difficulties associated with the use of econometric models for forecasting and policy studies come from inadequate understanding of the underlying micro framework.

Nevertheless, much progress has been made. Our understanding of the "laws" of the economy, in an empirical as well as in a theoretical way, is today much more sophisticated than before. We can simulate the behavior of the economic system, its response to alternative external events and policies. Indeed we can now do it on microcomputers. While there is still much to learn, econometric models have contributed much to make economics a useful quantitative discipline.

6

Credentials and Credibility— What are valid uses of knowledge and by whom?

Nancy Bauer
Education and Graduate Professional
Development/GSE & SAS

Be careful. You are the methods you use. The assumption is that the methods of that discipline have rubbed off on you. Those methods are valued by people who don't even know you. Their world view feels comfortable with those methods; they assume, without knowing you, that you and they are alike. Your skills have been miraculously transformed, out of context, into credentials.

So, what's the danger? The danger is in positive, narrow, skills-oriented stereotyping which ought to be very different from membership in an academic discipline. An academic discipline requires a personal commitment to a professional way of knowing. It demands particular uses of information and pays attention to particular forms and shapes of knowledge. Historical cases, biographical studies, statistical samples, political and social patterns, economic models are all, however, commanded by the individual who uses them. Methods have validity and reliability, but only a user can give the work meaning. By whom is the work used, i.e., whose philosophy and whose values dictate its direction? For what is the work done, i.e., to what end is the work dedicated?

And yet something strange happens to the academic experience if you aren't careful. It becomes a credential and loses almost everything in translation. All the time and money used in learning how to know and what to know often lead us to advertise our educational experience as a credential (I am what I got). Money leads educational institutions to promise that experience as a credential (You will be what we advertise). Time and money lead employers to assume that the experience is a credential (You are what you got).

The buzz words are "tools" and "skills." Skills are sold and bought without context or they are imbedded in a fixed content ever ready to be applied. The circle of skills and credentials from choosing a major, to giving a degree, to buying it in the marketplace is both meaningless and vicious as it fails to permit a breakthrough in focus, scope, philosophy, or shape of knowledge without paying the terrible price of loss of credibility. The credential is too often substituted for the personal credibility of the individual learner.

Academic faculties are partly to blame. Life at a university is measured out in curriculum revisions, the politics of credentials. One plan is undergraduate professional education with large doses of electives. How can this plan initiate a student into a profession without freezing the individual into a set of credentials? It

requires immersing the student in the historical trade-offs that have already been made to bring the profession to its present point. The electives, in Shakespeare, languages, and chemistry need to be brought back into the professional classes for discussion, contrast, and metaphor. Secondary sources need to be challenged by the world views of those that disagree with them. All of us need to know personally the raw materials from which our professors draw their conclusions.

At the other extreme in curricular negotiations, far from professional education, is the methodological smorgasbord. Recognizing that no single discipline or way of knowing is always best, core requirements are developed to force people to try at least four different methods. Unfortunately the four methods are usually tried on four different topics from four different time periods with four different philosophical stances for four different ends. The attention is paid to "doing it right," in case you decide to join. Without a comparison, the relationship of the way of knowing to your philosophical position may seem lost or irrelevant. No wonder people often choose the program by the method that is most easily converted into a credential.

We need to know something in depth; depth means we also know its own continuing arguments as it pushes at creativity and at new shapes of knowledge. We need to use the original sources out of which theory has been made. We then have the raw materials for new ideas of our own, as well as protection from a seemingly airtight model, interpretation, or argument.

Specialists recognize the implications of the current conclusions in their own fields. They know the poor fit of most applications. A specialist knows the struggle to stay creative. It is possible to educate specialists so that their credentials guarantee not only a preference, but also a built-in ability to grow, to link up, to spot assumptions, and to be committed to larger questions held in common with other well-educated specialists.

What we really want to know about a person is how will he or she deal with that specialty in contingencies of time, place, and people? In uncertainty? In the face of human emotions and mistakes? Credentials must go beyond tools and skills to include the need and the commitment to work continually at new ways of knowing.

Credentials and Credibility— continued

Paul Korshin
English/SAS

Why should academic disciplines and professions worry about so vague a concept as credibility at all, especially at a time when, as polls of all sorts assure us, trust in large institutions everywhere in U.S. society is lower than it has ever been? It is true that our belief in the honesty or rectitude of institutions—let us say, legislatures, business corporations, non-profit organizations, the press and the media—is not now so high as it was even so recently as the 1970's. But individual credibility, that is, our faith in a particular member of Congress, an executive we happen to know personally, an academic we meet with or with whom we study, a single newspaper reporter, continues to exist on the same basis that credibility has always existed. Institutions may seem unworthy of trust because some of us may regard their public objectives to be unpleasant, but we still evaluate individuals according to the traditional rules of trust. One may heartily loathe mankind but greatly esteem John, Peter, Thomas, and so on. Hence, the study of credibility may have a value, since such knowledge will permit us to understand what makes large institutions untrustworthy and what makes individuals—some individuals, anyway—believable.

Credibility is based upon information about something, whether it is information that we obtain ourselves or that we gather from others. Information that we obtain from others—secondary materials—has always been open to doubt: what if our sources are distorted, inaccurate, lying? But information that we gather ourselves may not be much better: evidence that comes from witnesses is also open to doubt, for many witnesses are untrustworthy. The sureties for the accuracy of testimony are well known, but many of the traditional methods of ascertaining that a witness is telling the truth—oaths, torture, risk of loss of personal comfort—have little use in everyday professional life (some societies still use them, notwithstanding their doubtfulness). Personal credibility, curiously enough, often is closely related to someone's apparent sincerity, established reputation, seeming acquaintance with a special topic, and so on. We call these bases of personal credibility credentials. Everyone wants to accept credentials without squabble, but we must learn to sense the possibility of distortion, forgery, self-aggrandizement, or some other kind of inauthenticity in all credentials. For every distorted resume or forged academic degree there is a case of false self-praise or an exaggerated letter of recommendation. The credibility of credentials, then, depends upon truth and accuracy or, to state the matter in reverse, upon the lack of lying, the lack of incomplete disclosure of evidence, and so on. Cred-

ibility, then, is no stronger than the information upon which we make our judgment of it.

Our information, our sources, must then be accurate. But accuracy at this level is not enough: suppose we have accurate materials available to us but do not make sound judgments? The most honest witnesses, the most accurate information, still can lead to incredibility, for those of us who evaluate information, those of us who interpret a text, must present a case about it to an audience. Yet we may reason about it incorrectly, we may be tintured by prejudice, we may frame inappropriate questions about it, or we may even write and speak poorly. Indeed, if writing well is a skill that we find but seldom in our society, speaking well is almost nonexistent in the late twentieth century. Schools everywhere—including this University—long ago dropped public speaking from their courses of study, while writing clearly is the sort of skill that comedians have made into a national joke, and the art of reasoning is a dinosaur. Credibility turns, then, upon two crucial concerns: one is whether the information we gather is accurate, authentic, and so on, while the other relates to how well we phrase what we have to say about it.

The study of credibility has many steps, starting with how well we think about information, moving on to the quality of our presentation, the ability of our auditors or readers to understand it, the sureties for truth that we give and that our audience finds, the lies and distortions that we slip into our words or that others think we have intruded, and ending with our perceptions of what a speaker or writer stands for—what group, organization, institution, or the like, he or she represents.

To understand credibility and how it operates may not be to become credible: no doubt society's greatest liars have the best knowledge of credibility.

But to understand credibility may allow us to seem credible. What could be better than seeming?

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Matters of Life and Death— How do the values of disciplines and professions shape views of life and death?

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Death is the ultimate philosophical issue. Death as an event and as a dilemma provides endless grist for public discourse. For the individual, the philosophic and spiritual encounter with mortality remains intensely private while it colors every moment of life. Why does death remain so problematic for us?

Death is also an omnipresent issue in the work of professions. Why more so for professions than for other occupations? For the physician it is the eternal enemy; but it also justifies his power to manipulate body functions, to open the body in surgery, and to perform other tabooed acts—even to be forgiven for causing death. The lawyer may be called upon to prosecute or to defend someone who has taken life, or to determine the price of a lost life. The military officer must reconcile his duty to take life with his responsibility to a civilized community. The engineer is expected to balance safety against cost. In the economist's calculations, life and death make claims on limited resources, to be measured against many other claims. Are these differences built into the professions as well as into the cultures in which the professions are imbedded?

These and other professions are committed to rationality and the ordered exercise of special tasks. Why are the American legal and medical professions so preoccupied with "death and dying" issues? Each profession incorporates a disciplined view of death, different from the views of other professions because the issues differ. Behind all of these views lies the private encounter with death as everyone's fate.

As people become professionals they take on a special way of knowing, and with it a disciplinary stance toward death. What are the characteristic stances of the professions? How are they like and unlike each other? How do they differ from lay attitudes? What educational and socialization processes shape these professional outlooks on death? What is the effect on their private views and fantasies? The stances vary greatly from one profession to another. They often lead to conflict, as when a doctor's liability for death under treatment is examined in the courtroom. All of these stances, because they justify the social authority of a specialty, move far from the simple finality of individual death. But because of that social authority, the responsibility for the life and death of others remains.

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Matters of Life and Death— continued

Renée Fox/Nathan Sivin,
continued

Professions in the United States today, as in other places and times, try to resolve the contradiction between rationalization and responsibility, to the extent that it can be resolved, with ethical codes and with rituals. How do professionals here and now, as elsewhere and at other times, remain in touch with the ultimate human dimension of their work that death always implies? In what ways does being in touch with death enhance and/or complicate a professional's relationship to his/her own humanity and to the humanity of their clients? Everyone committed to the practice of a profession has a stake in answers to this question.

Every individual and every society must deal concurrently with death. The modalities of dealing with death include philosophy, religion, science, technology, and magic. Since these Ways of Knowing are dimensions of every profession, what choices are available to professionals and their clients in their dealing with death?

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Knowing the Future— continued

Aron Katsenelinboigen,
continued from page 4

One could assume that our methods of thinking are a combination of indeterministic and deterministic approaches. The so-called scientific method is close to a deterministic one. It seems to me that the aesthetic method is close to the indeterministic approach. The core of an aesthetic method is the construction of an artistic image (Rodnianskaia, 1978). An artistic image looks like a potential which is on the one hand a structure involving along with the ingredients their relations and on the other hand it is not pragmatically oriented to a certain goal. *Beauty* is the measure of the degree of the development of this image.

It is possible to speculate that such a combination of methods of thinking has a physiological basis in our brain. Based on current knowledge of the structure of the brain, one could say that the right hemisphere is mainly responsible for indeterministic procedures and the left, for deterministic. . . .

It seems to me, that the usage of a new avenue in the studies of Holy Books—the epistemology of the narrators of a variety of these books and their attitude in indeterminism-determinism in particular—can help us to analyze the visions of the development of the world in different cultures.

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Jean Alter,
continued from page 5

I conclude that any "creative," i.e., not mechanically determined by causal accretion, representation of the future demands a well functioning self-regulation, i.e., a Representation trained in constant re-structurations, thus welcoming and generating associations between networks and their elements, solving conflicts at the expense of both the energy and stability of representations, exhibiting a willingness and aptitude to see old things in new ways thereby generating the potential to see new things.

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