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Toward a general model of collective learning: a critique of existing models of specific social systems and a sketch of a model for social systems in general.

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TOWARD A GENERAL MODEL OF COLLECTIVE LEARNING:
A CRITIQUE OF EXISTING MODELS OF SPECIFIC
SOCIAL SYSTEMS AND A SKETCH OF A MODEL
FOR SOCIAL SYSTEMS IN GENERAL

A Dissertation Presented
By
JOHN McCLELLAN

Submitted to the Graduate School of the
University of Massachusetts in partial fulfillment
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TOWARD A GENERAL MODEL OF COLLECTIVE LEARNING:
A CRITIQUE OF EXISTING MODELS OF SPECIFIC
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David Schuman, Chairperson of Committee
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Thomas Fraser; Member

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PREFACE

There is a growing band of social scientists who are examining the ways in which social systems may be understood as systems which in some sense "learn." Among the investigators are political scientists, organizational theorists, philosophers, sociologists and economists. Many of these have created models describing the "learning" process in the social systems which interest them.

In this dissertation I will examine four such models and try to clarify some of the issues they raise. Further, I will examine the possibility that behind the diversity of disciplining perspectives, there may be grounds for searching for a more general, cross-disciplinary model. Finally, I will enumerate issues a general model of collective learning would have to address.

The scope of such an inquiry is so great that I would not dare begin if I did not believe that the very scope and centrality of the topic promised some rewards for understanding. Perhaps I can suggest my sense of the importance of the topic by describing my experience as a graduate student, a person, a futurist, an
educator, and an observer of the social sciences.

First, as a graduate student, I have come to a deeper acknowledgment of the extent to which my own learning is supported by a larger collective learning process. I have come to have an appreciation for the immense body of knowledge and scholarly tradition that provide the ground for any new student. And at a more personal level, I have come to acknowledge my debt to those with whom I have had contact in this endeavor. This growth in appreciation is, I suppose, a necessary part of any graduate program. It is reflected in the fact that the "Acknowledgments" section of a dissertation is often both the most predictable section and the most poignant.

My case is no different from any other. My intellectual debts are too numerous to mention, or even remember. The thinking of Karl Deutsch, James March, Johan Olsen, Chris Argyris, Donald Schon, and Jurgen Habermas have become so much a part of my thinking, I cannot tell you where their thinking ends and mine begins. The same may be said of Edgar Dunn, Kenneth Bouldry, Donald Michael, and Peter Berger. Conversations with James Botkin and James Keen are woven into my thought. I am indebted to Howard Peele for helping me start, to Peter Wagschal for letting me explore, to
Tom Fraser for pointing me to apt anthropological studies, to David Schuman for raising fundamental issues, and to Dwight Allen for stimulation and prods to apply theory to practice. Thus, no matter how solitary the process of writing a dissertation, it is also, in many ways, a collective one. This dissertation is not the product of one mind, but of many.

My debt is emotional and practical as well as intellectual. I am indebted to Dwight Allen for his care of my person, as well as my intellect; to David Schuman for forcing me to finish despite my "best efforts to do otherwise"; and to Tom Fraser for his quiet support. It would have been hard to finish the course if some friends, especially Ed Frey, had not helped unlock some fetters. I am indebted to my family for their support and patience, and to my daughter Faith who, on typing the last word of my dissertation, insisted it be followed by an exclamation point! And beyond saying is my debt to steadfast Jean.

Such acknowledgment of intellectual and emotional debts is a way of suggesting the importance of collective learning as a field of inquiry. No one learns alone. We learn together.

Not just as a graduate student, but also in my everyday life do I see the pervasiveness of collective
learning. From the time the quartz alarm sounds to the time I turn off the eleven o'clock news, my day is surrounded by the products of collective learning. The T.V. is the product of lessons learned by countless people at Sony and elsewhere. The news is a societal process of self-reflection. The food I eat, the tools I use, the laws I follow, the language I speak, the goals for which I strive are all in many ways the cumulative learned products of countless learners preceding me. And what I learned may get used in at least some small measure by those around me. I live at the edge of an endless tapestry of collective learning, eager to add a few threads to the wool.

As a futurist, I launch this inquiry because I am worried about the capacity of our current social systems to solve the complex and dangerous problems which confront our globe. We all know the threats--of nuclear holocaust, environmental degradation, population explosion, economic crisis, injustice, social disintegration.

What is not often enough recognized is the extent to which these threats are problems of collective learning. They are the product of prior collective efforts, and demand collective learning for solution. For instance, the nuclear peril is partly the result of a certain success in collective learning. The learnings of
people like Bell, Einstein, Goddard, as well as the learnings of countless people at IBM, NASA, DoD, the U.S. and U.S.S.R.—have converged to give us nuclear missiles poised to protect the views of followers of Jefferson and Marx. Our predicament is the product of a vast tapestry of technological, ideological and social collective learning. And our task is to learn collectively ways to prevent such missiles' use, to institute new ways of managing international conflict.

The same analysis can be made of problems we face in energy, the economy, the environment and whole range of collective learning tasks. Behind all specific social problems, there is a more general problem—how to improve the collective learning by which problems are addressed. Thus, insofar as we can shed light on the nature of collective learning, to that extent may we contribute to the solutions of problems we face.

As a futurist, I am not only concerned with problems threatening the human future; I am also concerned with establishing a framework with which to promote more effective thinking about the future. The study of the future demands a theory of social change. Any attempts to predict the human future must rest on a theory of social change. But no such theory will be complete, I will argue, unless it includes an account
of the collective learning that permeates our lives and forms our choices. And any attempts to form a better future require strategies which at least tacitly include a view about how to promote a collective process of learning new collective ways of doing things. Thus, better definition of the dynamics of collective learning may help the field of "future studies" better assess the future and more effectively suggest strategies for change.

As an educator, I am motivated to launch the inquiry by a sense that the pervasiveness of collective learning and an understanding of what promotes it may have implications for our definition of purposes and methods of education. There may be a tendency in American culture to focus too much on learning as something happening in individual students, and too little as something that emerges out of the social life of the mind. If, as I will argue, learning is only incompletely understood as individual, and if our collective success may depend on developing the skills of collective learning, then perhaps a shift is called for, away from an individualistic approach toward a more collective one.

Finally, as an observer of social theory, I sense the time is ripe for a general model of collective learning. The various disciplines have accumulated a
great store of concepts, insights, data, conclusions, and grounded theory that bear on so vast a topic as collective learning. But their insights have remained departmental ones and few dare to see the subject whole.

Such departmentalization strikes me as an injustice to who we are. Humans learn, and humans are social; psychologists study the first fact, social scientists, the latter. But too few study the corollary to those two facts—a third, that humans learn together. The danger is that we might believe the division is real, that what we do as social creatures is separate from what we do as individual learners. But, of course, no such division really exists. I am socialized to a culture, and what I invent may change that culture. Individuals and social groups form one another. To think of learning happening only in individuals is like thinking the apple happens without the tree, soil, rain and sun. And to think of a disembodied "society learning" without individuals is like thinking the tree can grow without the apple's seed. We need to see the process whole. And, with the separate insights of the different disciplines, with the growth of interest in cognitive components of socio-cultural life, and with the contribution of the models we will study, I sense that we are ready for the reintegration of a more
complete understanding of learning.

As a step in that direction, I will, in Chapter II to V, review models of collective learning developed in a variety of disciplines. In Chapter VI, I will investigate whether a general model is possible in principle, and will identify some issues such a general model must resolve.
ABSTRACT

Toward a General Model of Collective Learning: A Critique of Existing Models of Specific Social Systems and a Sketch of a Model for Social Systems in General

September 1983

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This dissertation examines four models of particular social systems as systems which "learn," clarifies issues those models reveal, and uses those clarifications to suggest a preliminary model of collective learning by social systems in general. Models examined are the model of governmental learning by Karl Deutsch, the model of organizational learning by James March and Johan Olsen, the model of organizational learning by Chris Argyris and Donald Schon, and the model of societal learning by Jurgen Habermas. Each is assessed for its contribution and limits.

The dissertation suggests that all social systems have enough in common to permit, at least in principle, the development of a general model of collective learning, discussing issues which any general model will have to
address. These include questions of how to define collective learning, how to differentiate it from individual learning, and how to describe its dynamics. The dissertation suggests its own provisional responses to such issues in the form of a preliminary model.
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CHAPTER I
INTRODUCTION

This dissertation examines four existing models of particular social systems as systems which "learn." It clarifies issues those models reveal, and uses those clarifications to suggest a preliminary model of collective learning by social systems in general. Its primary objective is the clarification of the issues on whose resolution the construction of an eventual general model of collective learning must depend.

Use of collective "learning" in the social sciences

There is growing interest in the ways in which social systems may be understood as systems which in some sense "learn."

Perhaps one source of this interest has been the emergence of electronic control systems and computers as images of systems with the capacity to receive, process, and produce information. Concomitant with the emergence of such machines was the development of the thinking on which they rested--information theory, cybernetics, and general systems theory (Wiener, 1965 and 1967; Bertalanffy, 1968; Ashby, 1954). Another source may have been the articulation
of a body of theory about learning by modern psychologists such as Skinner and Piaget. At the same time there was growing appreciation for the difficulties of adaptation faced by social systems in an age of rapid change (Schon 1971; Michael 1968 and 1973; Toffler 1970; Emery and Trist 1972; Vickers 1971 and 1973). So it should not be surprising that a growing band of thinkers has turned to the imagery offered by cybernetics and psychology as a way of describing the dynamics of adaptation by social systems.

The interest in applying such imagery has extended to a wide variety of disciplines. Perhaps the field which has seen the most extensive use of the imagery has been organizational theory. Theorists who have in one form or another used the imagery related to "learning" in their analysis of organizations include Cadwallader (1959), Cyert and March (1963), Cangelosi and Dill (1965), Beer (1966, 1972, 1975), Katz and Kahn (1966), Wilensky (1967), Litterer (1969), Churchman (1971), Michael (1973, 1977), Argyris and Schon (1974, 1978), Hage (1974), Alderfer and Brown (1975), March and Olsen (1976), Nolan (1978, 1979), Duncan and Weiss (1978), Jelinek (1979), Hedberg (1981), and Shrivastava (1983).

The interest has been seen in other disciplines as well. It has been used in the analysis of politics by Deutsch (1963), Schon (1971), Steinbruner (1974), Etheredge (1983), and Etheredge and Short (1983). It has been used

Opportunity for integration

Every discipline has applied the image of "learning" in its own special way to its own special object of study. And within disciplines, each author has his own special view.

But I am intrigued that such a variety of investigators all find the imagery of "learning" to be suggestive in their attempts to understand their various social processes. Perhaps behind their diversity, they are
sensing the presence of a pan-disciplinary principle; perhaps there is a dynamic common to all social systems, a dynamic rooted in the way social creatures learn together. It is to such speculations that I am responding in this dissertation. I sense that an examination of the variety of perspectives on social systems' learning may reveal opportunities for insight and integration.

The choice of models for analysis

For this dissertation, I have chosen to examine four of the above models. They are Karl Deutsch's cybernetic model of politics (1963), March and Olsen's model of organizational learning under ambiguity (1976), Argyris and Schon's model of organizational learning as a correction of organizational theories-in-use, and Jürgen Habermas's model of social evolution as homologous to cognitive development. I have chosen these models because they are among the most extensively developed and thoroughly articulated models we have. As such, they offer the best material with which to understand what problems remain if we wish to pursue such models further. I have also chosen these models because they represent a variety of disciplines, social systems, and assumptions, and as such, may supplement each other and reveal more general patterns.
Issues that must be addressed

Through a close examination of each different model's assumptions, intentions, scope, concepts, terms, claims, and implications, I hope to clarify the range of issues we are likely to confront in trying to model the dynamics of social systems in terms of collective learning. The simple analogy that social systems, like individuals, "learn" is appealing, but before we can use the analogy seriously, we must confront a series of questions. These will include the following:

1. In what sense does the model claim that the social system is "learning"?
2. Who learns? The "system," a "group mind," just the member learners, or some combination?
3. Is that usage valid? Why?
4. When can the system be said to have learned? By what criteria?
5. How is such learning possible? What are its sources and processes?
6. Are varieties of learning distinguished? On what measures?
7. Can stages in development of learning capacity be distinguished? What is the logic of their development?
8. What factors are seen to help and hinder the social system's learning?
9. Is the model grounded enough to be of worth in practice?
What are the values from which the model grows and to which it aspires? Are these sufficient?

Does the model leave out elements in the life of a social system that have bearing on its process as a system that learns?

To what extent can the model serve as a guide in the understanding of other social systems as systems that learn?

These are difficult and slippery issues, but they are so fundamental that we must address and resolve them if we are to proceed with confidence in the construction of any subsequent model.

Defining "collective learning"

One of the primary issues will be to clarify the ways in which investigators speak of collective "learning," to ask if such usages are valid, and if so why. For, even if the analogy between individual learning and collective dynamics is appealing, we must still decide whether the analogy is simply a heuristic tool or one which accurately describes the workings of social systems. That issue will be one with which we wrestle throughout the dissertation.

One of the goals of this dissertation is to end with a clearer definition of "collective learning." In order for the reader to understand my intent, however, I ought at the outset give at least some sense of the territory
that interests me; I ought to offer at least a preliminary
definition of collective learning.

Perhaps the most honest and vivid way to begin is to
list examples of the kinds of things that interest me,
that seem in some way to involve aspects of collective
learning. I am interested in:

- How a family recognizes that it is having a recurring
  problem with finances, and institutes procedures for
  averting it
- How a School of Education moves from a traditional
  hierarchy to an experimenting polyarchy
- How Data General rushes out a new computer (Kidder 1981)
  but has trouble maturing in a recession
- Why Texas Instruments was able in the 1940s and 1950s to
  invent and market new products; was able in the 1960s to
  recognize that its success brought lack of integration,
  and to institutionalize an integrated, corporate-wide
  system of planning; but was unable in the late 1970s and
  early 1980s to capture markets for watches and computers
  (Jelinek 1979)
- How a scientific discipline adds to its knowledge and
  shifts its "paradigm" (Kuhn 1970)
- How food cooperatives have emerged
- How the Clean Air Act got passed and enforced
- Why Japan was quicker than the United States to respond
  to the shortages of oil by conserving energy-intensive
industries (Yergin 1982)

• How the United States decided to go to the moon, and how NASA martialed the resources of thousands of people in learning how to get there

• How science, technology, capitalism, and puritanism advanced in seventeenth century England (Merton 1970)

• How "computerese" and "valley talk" took form

• How speech, print, TV, computers and Atari games affect how people think and communicate

• How the Freeze Resolution got passed, and how to sustain that movement for the transformation of the way humans provide security

• Why the Catholic church was slow to question the war in Vietnam but has come to challenge the nuclear arms race

• Why the ancient Greeks shifted from a herding culture to an agricultural one, and then, to one based on olive oil and trade, but were unable to invent ways of adjudicating conflict between sovereign city states, bleeding themselves white in the end

• How the League of Nations and United Nations emerged, and how humanity might institutionalize effective modes of averting international conflict before, rather than after the next war

If the examples above help suggest the sorts of processes I consider to involve aspects of collective
learning, they do not define it. As a start at definition, let me say that I have in mind something like the process of change in a social system's culture. I am interested in how intelligent members go about changing their shared views of the world and their shared ways of doing things. I am interested in how they together invent new tools, reform their structures of social interaction, imagine new worldviews, expand their knowledge, mature their purposes, enrich their language, and elevate their discourse. I would like to know more about the process by which social systems adapt to changing realities, and how they expand the range in space and time in which they are able to comprehend their world and cope with it. I am interested in how people share what they know and how they achieve something like a growth of collective wisdom. I want to know how the lessons of individuals get combined and raised to the level of a lesson incorporated in the social system's culture. I want to know how the threads of individual learning are woven into the cloth of a collective apprehension of the world.

This list of interests and examples suggests that the term "learning" might be applied in a variety of ways to a variety of social processes. That in fact is what has happened; different investigators use the term to mean different things. As we shall see, Karl Deutsch uses the
term to refer to governmental information processing leading to decisions to dissociate and recombine resources to meet existing goals or to forge new ones. March and Olsen use the term to describe the process in organizations by which changes in individuals' beliefs about environmental responses get incorporated into organizational action. For Argyris and Schon, organizational learning is joint inquiry to detect and correct errors in organizational theories of action. And Habermas uses the term to refer to societal institutionalization of higher forms of individual cognition and reason.

One of the purposes of this dissertation will be to see whether there might be a common pattern behind all such processes. In chapter VI, I will examine whether social systems of all kinds and sizes share common features which might serve as the base for a model of collective learning by social systems in general.

In brief, I will use the terms that grow out of that discussion to define collective learning as a change in a social system's collective lesson set. A simple form of this is the addition of someone's new lesson to the aggregate lesson set accessible by others in the social system. A more difficult form is the collective alteration of the "co-ordering lesson set" shared by members of a social system and governing their interactions.
The collective learning process in this view is a continual dialectical interplay between individual learners and their more-than-individual collective lesson set. The collective lesson set shapes individuals and their learning; individuals' learnings are the material for change in the collective lesson set. The process is not random or mindless; it is the product of intelligent member learners who recognize problems in the collective lesson set and who enter into a collective dialogue to improve it. Collective learning arises from the desires of learners for a more satisfying and harmonizing order. Because every learner's experience of "reality" is different, the social dialogue is a prod to a broader understanding of reality and to a more inclusive social order. The result is an understanding not achievable by learners in isolation. It is more than individual learning; it changes the more-than-individual collective lesson set.

But, I get ahead of myself. This gives some sense of my meaning and intention in the dissertation. The hard work remains--to scrutinize with care the major models so far offered, to explicate the issues the models reveal, and to build on the insights, terms, and concepts they provide. My goal is more than exigesis; my central objective in this dissertation is to clarify the issues and terms on which an adequate general model of collective learning depends.
Before we go on to the examination of the major models, we should consider briefly the uses and limits of model-building as a process of inquiry.

**Model Building as a Method of Promoting Understanding**

The term "model" is used in a variety of ways. Sometimes it is used to refer to one physical system meant to depict another, as in a model airplane or molecular model. That will not be my usage here. Another usage is equivalent to "analogy." Thought about social systems has often advanced by the use of analogy. For instance, in *The Republic*, Plato saw similarities between qualities of the individual and the state. In the same way, any discussion of "learning by a social system" begins with an analogy between an individual process and a social one. Biological analogies have also been important in social thought, as in Oswald Spengler's view that every culture is born, matures, and must die (1918). More recently, James Miller (1978) has used analogy between all levels of living systems, from the cell to the individual to the international system, to develop a general theory of living systems. An analogy from cybernetics is the basis of much of the work of Karl Deutsch, one of the first and most thorough-going theoreticians of social learning systems.
Science can hardly proceed without such analogies. They provide the images and mental material which scientists can manipulate in their attempt to comprehend reality (Kaplan 1964; Nisbet 1969). It would be difficult to formulate theory without analogies and they remain embedded as an essential part of the theory's way of understanding reality. They cannot be discarded once formulation is complete.

The term "model" often refers to a specific kind of analogy—-one that can be depicted in a diagram, flow chart or other form of pictorial representation. These can be very helpful in identifying elements and their relationship. Argyris and Schon (1978) for example, use flow charts to represent the recurrent feedback loops typical of two different styles of organizational learning. Karl Deutsch's pictorial representation (1963) of the inputs, outputs, processing and feedback loops between elements of a governmental system helps draw together in a single view all the key elements and their complex relationships.

Such pictorial representations and analogies may be seen as subsets of a more general usage of the term "model." In this usage, widely seen among social scientists of the last few decades, a model is a mental abstraction which stands for or represents a concrete phenomenon. Or, in James Miller's definition, a model is "a formal identity
between a conceptual system and a concrete or abstracted system" (1978, p. 83). It is in Miller's sense that I will use the term model, examining conceptual systems that have a formal identity with concrete social systems.

Models in this sense serve to describe. But description requires a set of terms and propositions about them. Indeed, one of the main benefits of modeling of collective learning systems will be to foster the precise labeling of elements and their relations. This is especially important in a new field like collective learning. To contribute to a clarification of terms is one of the aims of this dissertation.

With clearer terms, it is then possible to offer precise propositions about the relations between elements of the model. These propositions may be tested, and in time, lead to a network of grounded propositions forming a theoretical system capable of explaining and predicting a class of phenomena. By then the initial analogy and early models will have given rise to something more—a mature system of thought.

Such a system of thought for collective learning in general is far off, and is no part of the objectives of this dissertation. Rather, this dissertation seeks to examine the root analogy and to clarify terms in its use.
Model building is an iterative social process. Each new attempt to define assumptions, terms, and propositions exposes what is unknown or problematic. And each model stimulates further thought. Thus, the authors reviewed in this dissertation build on the insights of each other and the work of others.

My hope in this dissertation is to begin sketching one more frame of a long film, one still picture as part of the larger motion toward a collective understanding of collective learning.
CHAPTER II
KARL DEUTSCH: A CYBERNETIC MODEL
OF GOVERNMENTAL LEARNING

Background

Karl Deutsch developed the first major model of a social system as a system that learns. As a political scientist, he was interested in the long history of attempts to create models describing the political process. In that history students of politics had often borrowed from images available to them, images often taken from the organic and mechanical world. But by the 1950s, during which Karl Deutsch began his work, a new set of images presented themselves, images taken from the world of electronics, computers, systems theory, information science, and cybernetics. In all these, the central image was of a system which used the flow of information to control processes.

One of the pioneers in the field of cybernetics was Norbert Wiener, author of Cybernetics (1948) and The Human Use of Human Beings: Cybernetics and Society (1967). The term, cybernetics, is adopted from the Greek "kybernetes" meaning a helmsman, the one who holds the
rudder and steers the boat. This captures well Wiener's concern with self-steering systems.

Karl Deutsch was a friend and colleague of Norbert Wiener and recognized the potential of cybernetics as a model for the self-steering nature of government. Such a model could capture aspects of government not contained in the older biological and mechanical models. He saw in the cybernetic image the possibility of modeling the senses in which the political process meant a certain kind of intelligence or learning.

Politics in Deutsch's usage is concerned with decisions, especially those decisions which are binding on members, either through members' voluntary compliance or through the state's enforcement. Since cybernetics was a science centered around making decisions for the control and steering of systems, Deutsch saw great potential in the use of cybernetics for the political decision-making process.

The Nerves of Government

The model which Deutsch developed received its first full description in *The Nerves of Government: Models of Political Communication and Control* (1963). Deutsch has continued his efforts to model political process throughout his lifetime, spending special attention on the modeling
of international relations. However, since our interest
in this dissertation is less with politics and more with
learning by social systems, we will focus here only on
The Nerves of Government. In this chapter, we will first
describe the key features of Deutsch's model; then we will
conclude with a consideration of the value of that model
in attempts to model collective learning by other kinds of
social systems.

A schematic diagram of Deutsch's model is shown in
figure 1. The model is an attempt to describe the dynamics
of political decision-making in terms of the flow of infor-
mation. As such, it relies heavily on the concepts of
cybernetics, some of whose main features we will describe
as follows.

One of the most important concepts for cybernetics is
the concept of "feedback." Feedback is information about
the result of a system's actions, information used to
modify subsequent actions. The household thermostat is a
common example of a cybernetic system using feedback. The
thermostat senses the temperature of the room. The thermo-
stat also has a control which sets the goal temperature
which the system would like to achieve. For instance, the
thrifty householder might set his thermostat at 58 degrees.
When the furnace is on, it heats the room to 58 degrees.
At that point, the sensor of the thermostat gets information
from the room, telling it that it has reached the goal
Figure 1. Deutsch's cybernetic model of political systems.
state of 58 degrees, and that information in turn is channeled to a switch at the furnace telling it to shut off. Then, the cold air outside cools off the room, the temperature falls below the goal state of 58 degrees, the sensor in the thermostat says, "We're below goal state, here is some more feedback, furnace. Turn on." This cycle by which the furnace gets information about the results of its own actions and uses that information subsequently to regulate its own behavior is called feedback. The furnace turns on and heats up the room and so forth, in an endless cycle of feedback and action.

We might also distinguish between amplifying feedback which tells the system, "That got us closer to the goal, do more of the same," and negative feedback, which says, "That got us further from the goal; stop or try something else."

As shown in figure 1, Deutsch's model incorporates the concept of feedback, linking the results of a government's "effectors" to subsequent "input" to governmental receptors.

There is a further set of concepts in cybernetics involving relationships between the goal, the system, and the time required to meet goals. One such concept is cybernetics is that of "lag," which is the time between a shift in the target, and the response of the system. For
example, the greyhound is chasing the rabbit and the rabbit veers left; there may be a "lag" of two seconds before the greyhound responds. Clearly, the shorter the lag time, the more responsive the system. This concept can be useful in considering the rapidity of response of a social learning system.

A second concept in cybernetics is that of "load," which is the amount of change in behavior per unit time needed to meet a goal. To take the case of the greyhound and the rabbit, the rabbit is such an artful dodger that a considerable load is put on the greyhound who is required to change behavior rapidly every few seconds. Applied to social systems, we can see that there are periods during which a social system has a heavy load of change per unit of time to deal with. Load is a factor in what is commonly called "future shock." In comparing social systems we can compare the size of load they can each carry. For example, the performance of Texas Instruments has indicated that they can carry a heavier load of change than that of their competitors.

A third such concept is that of "gain," which is a change in behavior in response to new input. For example, the greyhound on seeing the rabbit turn left may also turn left. The catch here is that the gain may either overshoot or undershoot. Thus, the greyhound may decide to turn only part of the way to the left, undershooting the actual turn
on the part of the rabbit. A clearer example might be that of the skeet shooter who, in leading the clay pigeon, overshoots. An example of this in a social system might be the response of the automakers to the input about an increasing demand for small cars. There may turn out to be instances in which automakers have "overshot" and put too much of their effort on the production of small cars. Plymouth, for example, may have put too many of their chips on the lemon of a small car they produced to compete with the Volkswagen Rabbit.

A fourth concept is that of "lead," which is the time within which the system can predict the future state of the target. A greyhound chasing a turtle has a long lead time within which to predict the future state of the turtle. But he does not have a long lead in chasing the rabbit. Likewise, in an age of rapid change and future shock, it can be seen that many social systems have less and less lead time within which to respond. For instance, if a target of United States military policy is to maintain a level of technological competency equivalent to that of the Soviet Union, given the exponential rise in scientific and technological development, there is less and less time within which the policy-makers can be sure just what level of technological competency the Russians will have. They could develop entirely new military technologies within a matter of a few years. That gives policymakers a short
lead time, bringing with it certain kinds of anxieties which I believe are dangerous.

Deutsch's chart in figure 1 reflects the influence of cybernetics. The habit of modeling processes with boxes and arrows has become part of the vocabulary of cybernetics and systems worlds. The reader should recognize that they are mere ways of trying to represent a reality which is far less clearly drawn than are the boxes. However, within Deutsch's model there are certain features which are recurrent features of cybernetic models. First, there are receptors, or sensors, modes of knowing what is happening outside the system and inside the system. I find it impossible to conceive of a system having in any sense an intelligence without such receptors.

Second, there is the concept of memory or storage. Since a system exists in time, it must have ways of connecting its present situation with situations in prior times. Without such connections in time there can be nothing that has the sense of the word "learning." The system becomes nothing more than flotsam on the waves of time.

A third concept is closely associated with that of storage. It is not enough to store information about prior times. That storage must be recalled. Further, there must be a principle of selectivity in the recall. Learning, to be true learning, must carry with it a degree of aptness
in the response of the subject. That aptness demands the principle of selectivity, matching what is stored in memory with what is sensed in the current situation.

Matching may be a fourth principle implicit in Deutsch's model though not explicitly represented. What is represented in Deutsch's model is the "decision point." This is the point at which two streams of information converge requiring a decision. Deutsch, incidentally, feels that usually it is better for a system to have many streams for decision-making rather than one, allowing a comparison of decisions.

A fifth concept in Deutsch's model is that of "effectors." The system does not exist in a vacuum; it does something with the information it receives and matches with its memory to result in decisions. It then does something. On the chart you can see that the output of the effectors loops around to become feedback, or input for the receptors.

The sixth element in Deutsch's model is one which to my knowledge is one of his own devising, "consciousness." By saying that a social or political system might have consciousness, Deutsch means that the system is self-monitoring for coordination, simultaneous inspection, and decision. That involves the processing of second order messages, abstracted from first order messages. For example, "war rooms" allow simultaneous inspection of messages about the state of the system and its environment.
This gives the political system a measure of self-control insofar as it knows what is going on inside and outside the system.

However, there are certain limitations built into consciousness itself. First, it costs time and money for a political system to monitor itself thoroughly. War rooms are not cheap. Further, there is the danger that this so-called consciousness in its very nature may abridge, constrict, and distort reality. A message about a message must necessarily be less than the first message or else it is the message itself. It is this kind of problem that is built into the process of modeling, for example. A model must be less than that which is modeled or else it is not a model. But, insofar as it is less, it may distort that reality. This is a problem of consciousness too.

I find Deutsch's concept of consciousness both thought-provoking and slightly limited. I am certain that his talk of consciousness of a political system has helped people look at political systems in a new way. However, I believe that it is unclear in his system exactly in whom the consciousness exists. Is it in President Johnson and his cohorts in the war room? Or, is it in the polity at large? Or somewhere else? If it is in Johnson, can that consciousness strictly be called systems consciousness or is it not merely individual consciousness? If it is in the system, where in the system? It is for considerations
such as these that I find it useful to keep in mind that what exists is a combination of lesson sets and learners. The lesson sets on the one hand can be viewed as embodiments of consciousness. The "situation map" in a war room is a collected consolidation of the perception of large numbers of military and intelligence personnel around the world. In my terms, it might be viewed as a lesson set. On the other hand, that lesson set is being operated on by individual learners like Johnson, McNamara and company. There is a dialectic of learners and lesson sets. I do not believe that that dialectic is adequately represented in Deutsch's model.

Another limitation of Deutsch's model is its centralist orientation. The implication is that decision-making is done by discreet central units. My impression of the actual workings of government is that it is considerably more messy than that. There is an interplay of countless individuals, interest groups, forces and considerations, making for decisions that seem more to happen than to be made. A similar objection is that implicit in his model is the view that decisions are somehow made rationally, that is, there is the collection of relevant information matched with relevant memories, confronted and simultaneously inspected for a conscious decision-making process that leads to action. Again, my impression is that decisions made by governments are not made nearly as rationally as
the neatness of the boxes would suggest. However, I am
not sure that Deutsch would disagree with this. I think
his point is to try to represent in schematic fashion
certain of the logical requirements and interactions in-
volved in governmental decision-making.

I will go on here to further aspects of Deutsch's
model. It is interesting that Deutsch distinguishes
different levels of learning that are not unlike those of
Donald Schon. First, he talks about changes in responses
to meet fixed goals; second, changes in goals for the
larger purpose of self-preservation; and finally, some
thoroughgoing self-transformation for larger purposes be-
yond self-preservation. He further notes that such changes
can happen gradually as may have been the case in the
evolution of British parliamentary procedure, or by
revolution, as in the French Revolution.

Deutsch also attempts to identify the processes
needed for a system to have creativity and learning capacity.
There are two elements in this view.

First is that there needs to be the possibility of
"dissociating" elements. The system needs to be able to
break up its existing configuration into parts. But that
breaking apart, to be useful, needs to lead to the second
process which is the "recombination" of the elements int o
a new configuration. A sequence of dissociation of elem-
ents and their recombination is, in Deutsch's terms,
creative on the part of the system.

I believe the case of Texas Instruments, described by Jelinck (1979), may fit here with what Deutsch is trying to describe. At Texas Instruments, until the early 1960s, there had existed a decentralized system of independent product customer centers responsible for their own planning, innovation, manufacturing and marketing. Their reorganization in the 1960s in a sense dissociated the functional elements of the existing system and rearranged them in a new order. The product customer centers continued to be responsible for particular innovations and manufacturing, but some of the marketing, and much of the planning activity, became reorganized into a corporate-wide process. This cut down on overhead, eliminating unnecessary overlap of the marketing function, and allowed for more coherent long-range planning.

I see Deutsch's notion expressed in various ways among many of the people talking about organizational theory. For instance, Donald Schon advocates the separation of resource units available to an organization at large, and task units, assigned particular tasks. These task units may then call resource units when they need them. In Deutsch's terms, such a configuration allows for the continual recombination of elements in the organization according to the specific demands.
This possibility for dissociation and recombination is the factor which gives rise, in Deutsch’s opinion, to learning capacity. By learning capacity, Deutsch means the range of possible effective internal dissociations and recombinations within a system. This learning capacity varies with the uncommitted and reassignable resources within the system. In Deutsch’s view, although it is difficult really to assess the learning capacity of a given organization, a rough measure of that learning capacity is sometimes the size and complexity of the system’s structure. He believes that the more complex the structure, the more capacity it has for differentiated reassignment of its resources. I am not sure that that is always the case. However, I think his principle is worth heeding, that a social system which can reassign its resources and bring about new recombinations of its elements is one which may be viewed as having a good learning capacity. On the other hand, a social system incapable of reorganizing its internal elements or reassigning its resources would be so rigid as hardly to deserve the description of being capable of learning. If there still remains confusion about what Deutsch means by this learning capacity, we can think of individual learning capacity, and it is probably true that individuals who are able to dissociate their prior config- of ideas and to rearrange those elements in some new configuration are individuals whom we tend to view as
intelligent.

I would add once again that the distinction between learners and lesson sets may help to advance further Deutsch's notion of learning capacity. It is not enough to ask a social system to rearrange its parts. We must also ask how that is possible. I believe that one of the elements making that possible is the examination of the social system's own lesson sets by the individual learners. A rearrangement of the system's elements without such examination would be a mere random, mindless rearrangement. The mind quality, as always, comes from the individual human learners operating on the materials around them. Therefore, to repeat my theme, I think it behooves social systems to encourage their member learners to examine the existing social lesson set as intimately as possible, and further, to encourage those learners to suggest possible modes of rearranging the lesson set elements.

Deutsch's Contribution to the Search for a General Model of Collective Learning

My concern in this dissertation is with the collective collective human process by which we might gain a greater understanding of our own collective learning. To what extent has Karl Deutsch's model contributed to that search? Is his cybernetic model of general enough validity that it
may be fruitfully applied to the understanding of social systems of all kinds and sizes? Are there any important aspects of the collective learning dynamic which seem to be left out of his model? To what extent can it serve us in the practical business of improving our collective learning systems.

Deutsch's influence

I cannot emphasize enough how original and influential Deutsch's model has been and continues to be. It was the first major attempt to model a social system in terms of learning capacity. The very notion of seriously pursuing the idea that governments in some sense "learn" was a landmark contribution. Others in political science and systems theory immediately recognized the potential of that notion and have pursued it in diverse ways. Among the more cybernetically minded we might cite Ashby, Beer, Laszlo, and Miller as among those who have pursued similar lines of thought. However, among many of these, the tendency has been to keep more strictly to the cybernetic and electronic model. There the interest has been in systems of communication, decision, and control. However, what is intriguing about Deutsch is that to this he has added the imagery of learning, which is something more than the mere processing of information. Indeed, this tension between the cybernetic imagery and the human imagery of learning may be one of the
sources of confusion in Deutsch's model. Besides the cybernetically minded, there were others influenced by Deutsch's work. These included political scientists such as David Easton, who pursued a similar systems analysis of political life during the same period (1953 and 1965), but most important for our consideration in this dissertation is the set of people who pursued attempts to model social systems of one kind or another specifically in terms of learning. This is especially true in the work of Donald Schon and Chris Argyris whose models we will consider at length in chapter IV. It is also true of others including Edgar Dunn, Kenneth Boulding, Donald Michael, and James Botkin. Whether directly or indirectly, one can see the influence of Deutsch's ideas throughout their works. By offering his model, he made concrete a number of issues which must be dealt with in any attempt to understand the process of collective learning.

In what ways can Deutsch's model be applied to to social systems in general?

Deutsch's concern is with politics, especially that part of politics involved in decision-making. To what extent do other social systems like families, corporations, schools, and the human species at large share features of the nation state which is Deutsch's object of study in The Nerves of Government?
First, it is probably true that all social systems of whatever kind or size, must engage from time to time in the process of making decision. Since decision-making is Deutsch's central concern, his model here may have general applicability. However, this should not obscure the fact that different social systems may have different degrees of concern about decision-making per se and may engage in that process in different fashions. It is true that it is one of the central concerns of the United States congress and of the United States presidential administration and of the supreme court to be deciding continually on issues. That is their business. But decision-making may be less the business of other social systems. A college fraternity, for example, is in many ways a discreet social system, but it is relatively little concerned with making decisions and considerably more concerned with making merry. Thus, the degree to which Deutsch's model is applicable to social systems in general may vary with the degree to which decision-making is central to that system's purpose. Further, even when decision-making is a central purpose of a social system, that in no way guarantees that the process will necessarily be accurately modeled by the model suggested by Deutsch. For example, governmental units within the United States may follow different processes for making decisions. Town government may hold in one locality; town management, in another. And town government may in certain
ways differ from the decision-making processes of the federal government. Further, it is surely true that the decision-making process of the government in the Soviet Union is different from that in the United States which in turn is different from that in South Africa or India. It may be true that Deutsch has accurately identified the full range of functions that any decision-making entity must perform. But the mention of these functions alone may not be adequate to describe fully differences between different decision-making organizations.

Nonetheless, all decision-making social systems may be seen to share a second common characteristic, namely the processing of information. I find it impossible to think of any social system without thinking of its having at least some degree of information processing. Humans do process information. That does not mean that we are computers. But we do take in information, toss it around, and give out information. This is a social process, and a process engaging us with our environmental realities. Information processing is something that can be seen in a family deciding what to buy at the grocery store or in a corporation deciding what to charge for a new product. I think it a fair assumption that all social systems share this attribute. Therefore, Karl Deutsch's model will surely be useful in understanding that aspect of social systems in general.
A third way in which social systems across all levels may share attributes of Deutsch's model of politics is in the presence of what he calls "learning capacity." You will recall that by learning capacity he means the ability to dissociate and recombine resources to meet changing demands. Just as the United States government must decide every year on a budget, so too must a family. Even though that budget may shift little from year to year, those shifts represent the kinds of redistribution which Deutsch sees as a part of a government's "learning," or shift in programs or goals. Just as a government may decide on the adoption of certain retraining programs, so too may a corporation. Just as a government may one year decide to draft young men into the army and another, to send them off to the Peace Corps, so too may a fraternity one month decide to spend its energies on making snowmen and another, on making money for the blood drive. This stress on the dissociation and recombination of resources is probably the singlemost import element in Deutsch's view of collective learning, and it may be seen to hold across all levels of social systems.

Learning capacity, however, is something which according to Deutsch varies with the size and complexity of an organization. His claim is that the more complex a governmental system, the more likely it is to show increased learning capacity. If we accept that notion for
the moment, it would imply that there are ways in which comparisons of small social systems with large social systems would be invalid, at least in terms of their capacities to learn. That is, there may be ways in which familities are not so smart as the United States government. This does not mean, however, that the examination of the capacity to dissociate and recombine resources is not something that does not hold across all levels of social systems, and it may provide a useful yardstick for the comparison of the capacities of varying social systems.

Limitations of the model

If, as we have argued above, Deutsch's model can be seen to apply to all kinds of social systems--systems which make decisions, process information, have a political life, and dissociate and recombine resources--can we then apply his model to all social systems as a model without reservation? No. For my part at least, Deutsch's model does not do justice to the full human reality in collective learning endeavors. Of course, it is very easy to criticize a model, especially one as early and original as Deutsch's, by what it leaves out. And, as I hope I have suggested above, what is in Deutsch's model is in many ways highly useful. But I feel we must build on what he has offered to form a more complete description of human collective learning. I will try here to suggest a few
aspects of collective learning that Deutsch may not have included in The Nerves of Government.

By focusing on decision-making, we should not forget that there may exist other forms of human collective learning. Not all learning is centered around decision. Somehow to talk about the advance of science as centered around decision is surely inadequate. Yet surely science is one of the hallmarks of collective learning. So too with the evolution of worldviews, philosophies and myths by which we somehow capture what we have learned about our world. Here our learning is centered not so much on decision as on description—another form of learning. It may even be possible to talk about subtle shifts of attitude and confidence of the public toward government in the decade and a half since Vietnam and Watergate. Yes, that shift may to some extent be viewed as a "decision" to put less trust in the leaders of the country, but it is better viewed as a shift in perception or commitment, learned as a result of experience. Not all collective learning is explicable as decision-making.

Second, even when decision is at the center of collective learning, that does not necessarily mean that it takes on the centrist form implicit in Deutsch's model. There is a sense that by and large Deutsch's concern is with what governmental decision-makers in Washington do as opposed to what citizens in Peoria may think. Again
that is fine as far as it goes, but it leaves something out, something vital to the political process—the participation of the people.

Such a centrist view is a natural outgrowth of Deutsch's original metaphor—the model of a helmsman at a rudder. But a state is not a ship; it is a collection of humans. These humans have a multiplicity of goals, often pointing in different directions. If the "ship of state" were really a ship, it would likely be torn into dinghies, each on its own trip. Of course, it may be true that the "ship" can be seen as settling on a final vector, but that settling is not the work of a single helmsman at a rudder—it is the result of a very social, "political" process. I think Deutsch would agree with this; my only objection is that the focus of the model is such that it lends itself to a centrist orientation. We will see a contrast to this later in the model of governmental learning offered by Donald Schon. In brief, Schon sees the role of government to facilitate a public process of learning, one in which most often ideas arise at the "free margins" and work themselves into the center of governmental thinking only after a long, and complex social process. Such is not the perspective offered by Deutsch.

Related to this reservation about this centrist quality of Deutsch's model is a feeling that his chart
does insufficient justice to the role of the environment in collective learning. It is true that his model depends heavily on the notion of feedback which occurs between the time that governmental effectors do something and the time governmental receptors detect reactions. But little is said by Deutsch about what happens in between. Yet that surely is an important part of the whole process, a part that needs elaboration. Thus a decision in Washington affects citizens in Peoria and policymakers in Moscow. the nature of those effects may be critical to an understanding of the whole picture.

In a similar way, there may be another form of feedback not properly elucidated in Deutsch's model, an aspect whose absence forms my fourth reservation. That spect concerns the effects of decisions on the very model itself held by the government or social system. What I mean to say is that what a social system does may in turn change how it learns. Or, to put it another way, a social system can learn about itself. A social system can learn about how it receives information, and may decide what to receive and what to exclude. It may learn to screen some information and exclude others. It may learn to accept some things as important, and ignore others as trivial. It may learn that some ways of "confrontation and simultaneous inspection" work better than others. It may learn that some ways of "effecting"
their decisions work better than others. That is, all the functions identified by Deutsch are themselves objects of collective learning. This aspect of collective learning may be critical to the kind of self-examination and self-transformation to which he alludes and yet, are not properly or adequately described in his model.

A fifth feature of learning not adequately represented in Deutsch's model is consideration of the future. Deutsch's model tends to stress feedback rather than "feed-forward," or the anticipation of possible feedbacks before a decision is made between alternatives. Yet such anticipation is surely a central feature of human psychology (Kelley 1955). It is an especially important feature today, when the pace of change is rapid, the complexity of our actions, immense, and the potential consequences of them lethal.

For instance, anticipation by the human body politic of the consequences of nuclear war is imperative if we are to prevent it. Somehow, there does not seem to be adequate room in Deutsch's model for such anticipation.

Perhaps the reason anticipation is not an apparent feature is that Deutsch has been so intent on pressing the ways politics is like cybernetics that he has failed to return to the fact that politics is about people, not machines. This is the last omission I will mention, and one with the most significance.

This helps to explain my strange feeling that the
politics his model describes is only part of what I feel is fully politics. Let us consider the politics of the arms race. There are indeed many important features of it which Deutsch's model highlights well. For example, it describes well the feedback loop by which "the government" in Washington a) "effects" a decision to build a new weapon; b) "inputs" the reaction of the government in Moscow (to build one too); c) screens its recall to forget that it built the first weapon; d) decides the Soviet Union is the focus of evil in the world, intent on world domination; e) decides it might then be good and godly to build a first-strike system; f) to n), continuing on (forever?).

But there are other aspects of this whole "story" that seem left out. Consider my little town, Woodstock, Connecticut. In the fall of 1981, a number of townspeople were independently growing alarmed at President Reagan's bellicose talk. One person, on hearing Helen Caldecotte, visited her Women's Party for Peace offices, came back, and called a meeting. Five people came. Over the winter, word spread, the numbers grew. In March, the Town Hall was filled with 175 people. They spoke their piece. And when the resolution for a nuclear freeze was put and 166 hands went up for "Yes," it looked like a collective form of prayer. Deutsch's description does not show the people in that setting, nor the tens of millions engaged in similar ways.
Rather, the boxes in the model are faceless; the model is mute. And if one imagines people in the model, they are men in the war room of the White House, backs to us, staring at controls. If one imagines words, they are "Fear not, dear people of Woodstock, we know how to decide about nuclear war here in Washington."

Of course, such an image is a gross injustice to Karl Deutsch, who has devoted his life to the modeling of international affairs and to the quest for peace. But if the image is unfair to Deutsch as a person, it may not be unfair to the culture from which his model arises. For his metaphor is taken from electronics, and electronics in many cases have been robots born of war. The electronic communications and controls, the computers, the systems theory, the cybernetics which are the source of Deutsch's inspiration were largely inspired by massive military research and development during World War II and the Cold War that followed.

These robotic genes have two consequences for the model Deutsch produced. The first is that his model of collective learning is less than human. He tries to ascribe to collections of humans one of his most precious qualities as a human--his ability to learn. How does he make this ascription? By mimicking chips. It will not work. The analogy is limited from the start, because electronics do not have the quality of mind essential to what we fully
mean by "learning."

Yes, there is today great interest in artificial intelligence, but it is very far from demonstrated that the kinds of quite ingenious things computers can be made to do approach what is involved in human learning. Choosing moves in chess is less than engaging in discourse on war at town meeting. Guiding a missile over the Urals is different from inventing new ways to solve international conflict.

With such robotic roots, then, it should be no surprise to see the model ascribing "consciousness" to "governments." In Deutsch's definition, such consciousness involves self-monitoring for coordination, simultaneous inspection and decision. It requires the processing of second order messages about first order messages. But what is lost in the building of this electronic icon is that it is humans who are doing that "monitoring," "inspecting," "deciding," and "messaging." Not chips.

The second consequence of these robotic roots is that a politics of chips, rather than of human souls engaged in collective speech and action, is a politics without sensitivity, perhaps a politics of extinction. It is one thing to design cybernetic systems capable of launching World War III with neither a tear nor a grin; it is another to reduce the political decision to the same. That is dangerous. Safer is a view of politics populated by
populated by people hearing one another out at town meeting. Not so neat, perhaps, as cybernetics. But human, and hence capable of learning.

That, then, is my central reservation about Deutsch's model. He has left the learner out. He has forgotten the source. Instead of a vision of collective human learning, we are left with a diagram of collective electronics.

So, in our search for a general model of collective learning, there are many elements from Deutsch's cybernetic model we could fruitfully use. But to these, we must reintroduce the actions of human learners.
CHAPTER III
MARCH AND OLSEN:
ORGANIZATIONAL LEARNING UNDER AMBIGUITY

The concept of feedback advanced by cyberneticists and incorporated by Deutsch was also quickly adopted by organizational theorists. But feedback for an organization is seldom as clearcut as it is for a thermostat. In a thermostat there is no ambiguity about the temperature set as the goal, the method of sensing environmental temperature, and the rules for warming the room or letting it be. All aspects of the feedback loop are clearly defined and have mechanical dependability. Not so for organizations, and it is organizational ambiguity that forms the material of the work of James March and Johan Olsen.

Background

James March has long been a leading theorist of organizational behavior. In 1958, with Herbert Simon, he wrote the widely influential Organizations, a review and critique of existing theories of organization. There they provide a number of concepts underlying March's later theorizing about organizational learning. Among these is
the importance of conflict in organizations, especially between organizational units. These conflicts may arise from the need for a joint decision, differences in goals, and differences in perceptions of reality. Organizations seek to restore equilibrium through analysis of the differences and through group politics and bargaining.

The existence and resolution of such conflicts are clearly embedded in March's perception of an organization's ability to perceive environmental reality and to change organizational "programs" and goals. The resolution of conflicts, in March and Simon's view, seldom aims at or achieves an "optimal" solution. Rather, decision makers tend to "satisfice," to settle on an alternative that at least meets minimum standards of satisfaction. The need for satisficing in part grows from the limits of rationality in organizations, which seldom have a clear and complete picture of all alternatives, nor a complete and universally accepted set of goals and criteria for evaluating such alternatives.

From information science, March and Simon borrowed the term "programs" to describe the standard operating procedures followed by organizations. These "programs" are complex sets of responses giving detailed instructions for the coordination of tasks and for the solution of recurring problems. An example might be the standard operating instructions in producing a Volare station wagon
at a Chrysler plant. When existing programs do not satisfy the organization's goals and criteria (often because of changes in the environment), organizations may change their old programs, invent new ones, or borrow from other organizations already having a satisfactory program. Thus the organization's programs can be seen as a product of the organization's problem solving process.

March continued this line of thinking in his collaboration with Richard Cyert, giving rise to *A Behavioral Theory of the Firm* (1963). There they describe the cycles of experiential learning by an organization in its interaction with its environments. An organization is seen as preferring at a given time one "state" over others, and as having internal decision variables and rules. An uncontrolled external "shock" leads to a decision which changes the system's state. Decision rules which lead to preferred states are more likely to be used in the future than rules which do not.

March's longstanding concern about the limits of rationality of organizations is continued in his collaboration with M. Cohen, in *Leaderships and Ambiguity: the American College President* (1974). There they examine situations of ambiguity in which organizational leaders must rely on shaky inferences about the effects of their organization's behavior on the environment.
Ambiguity and Choice in Organizations

The concerns with ambiguity and the interest in cycles of experiential learning are combined in March's collaboration with Johan Olsen of the University of Bergen, Norway. Together, they edited Ambiguity and Choice in Organizations (1976), a collection of articles about organizational choice. Here, I will focus on their presentation (in chapters five and six) of their own model of organizational learning as it proceeds when conditions interrupt or weaken a full cycle of organizational learning.

March and Olsen see "organizational intelligence" as built from two processes: 1) rational calculations about consequences of choices and 2) learning from prior experience. But they see most organizations as severely limited in their ability for rational calculation. Rational planning, forecasting and decision-making are made difficult by the existence of conflicting goals, lack of awareness of alternatives, and insufficient knowledge about the consequences of their actions. Therefore the other process for "organizational intelligence" seems critical—the trial and error experimental process by which managers see which organizational behaviors lead to success or failure and improve the organizational behavior accordingly. But March and Olsen see even this experiential learning as
limited in the real world of organizations. In most real organizations, policy makers are faced with considerable ambiguity about what happened and why. In the face of such ambiguity, they are forced to make decisions on the basis of interpretations of reality which may or may not be valid.

The complete cycle of experiential learning.

To understand these limitations, let us first examine March and Olsen's model of a complete cycle of choice in which each step of experiential learning clearly affects the next in an unambiguous way, as shown in figure 2.

![Diagram](image)

Figure 2. March and Olsen's complete cycle of choice.

The lines in figure 2 may be read "affect," as in "individuals' cognitions, preferences, and models of the world affect their actions or their participation in a choice situation."
March and Olsen draw most of their material from the study of cycles of learning in university settings, but for our purposes let us consider some examples drawn from the United States Department of Defense. Consider for example individuals in the Department of Defense who held a set of beliefs and model of the world under which the United States and Russia would deter each other from nuclear attack under the doctrine of "mutually assured destruction." Let us also assume that those individuals prefer to keep the United States superior in technology and without any vulnerability to attack. This set of beliefs, then, can be seen as having led them to participate in a choice to develop an arsenal of intercontinental ballistic missiles capable of striking the Soviet Union in retaliation. This set of proposals and actions gave rise to an organizational action on the part of the Pentagon to develop a wide arsenal of intercontinental ballistic missiles. But the effect of this development on Russia was of course to spur Russia to the development of their own arsenal of intercontinental missiles. As the Russians responded with more powerful and accurate missiles, their actions affected the individual beliefs and models of the world of the individuals in the Pentagon, who then perceived the world as more dangerous and as one in which the United States was vulnerable to a preemptive first strike by the Soviet Union. In their view, reactions of Russia put into question the efficacy of
the traditional Mutually Assured Destruction ("MAD") doctrine. "Learning" from the Russian response, they can be seen as having taken individual action to propose a new round in the arms race, which in fact was that chosen as the outcome of the organizational decision making of the Pentagon in the late 1970s. Those decisions led to the decision to develop a new counterforce capability in the United States' arsenal including the development of the MX missile and highly accurate first strike weapons launched from Trident missiles. We have yet to see what the Russian reaction will be to that and where the next cycle of learning will take us, but at any rate, there is a limited sense in which the Pentagon employees can be seen as having "learned" from the environmental response of the Russians to the arms race.

This, I think, would satisfy March and Olsen as an example of a full cycle of experiential learning. One might note, however, that the learning in this full cycle was confined to the field of vision of the individuals in the Pentagon and in no way transcended the dangers of a self-fulfilling prophecy and an endless loop in the arms race.

Role constrained experiential learning.

Usually organizations lack even the limited range of experiential learning available through a completed cycle
of March and Olsen's model. Organizations are often denied a clear and unambiguous understanding of the environmental responses. In terms of their model, very often the lines of causality between boxes may be broken and this in turn affects the quality of experiential learning. For instance, it is common in organizations that individual beliefs and views of the world may have little effect on their individual actions, as diagrammed in figure 3.

Figure 3. Role constrained experiential learning.

Let us imagine, for example, an individual working in the Pentagon who on his own account begins to examine the continuing cycles of experiential learning by which the United States and Russia respectively react to one another's buildup in arms in a spiralling arms race. Let us also imagine that this individual perceives that one of the requirements for ending the arms race would be the development of a new set of technologies making verification of arms treaties relatively certain. What is our
imagined member of the Pentagon to do in his role at work in the Pentagon? Is he to march into work one day and announce a plan for the cessation of the arms race? Probably not. "It's not my department."

March and Olsen call such a situation "role constrained learning" (1976, p. 57). In this case an individual may have learned from the environment but has no role in which to take action on his perceptions. There is no way in which his individual learning may lead to organizational adaptation.

I would add that it may not be just role definitions which may constrain an individual from taking action on the basis of what he has learned. For example, one can imagine an employee in the Pentagon whose role it is to consider verification technologies but who nonetheless does not take action, not because of role but because he may be too busy with other things, may not have the staff or budget to devise a plan, or may be waiting for a more opportune moment to act. Thus I find the descriptor "role constrained" too narrow. Perhaps something like "actor inhibited" might be more inclusive, but it is not the label that is important. What is important is the block which often exists between individual beliefs and actions. Organizations commonly inhibit collective learning in this way.
Audience experiential learning.

A second break identified by March and Olsen is shown in figure 4. It occurs when an individual does take action on the basis of changed beliefs, but the individual action has no effect on organizational action, or has only an unclear or ambiguous effect.

![Diagram of the audience experiential learning model]

**Figure 4. Audience experiential learning.**

For example, one can imagine that if someone in the Pentagon did in fact propose a major new development in verification technologies that the Pentagon as a whole might reject such proposals on the grounds that verification is not the Defense Department's main concern and that limited resources must be spent on the development of weapons instead. March and Olsen call this "audience experiential learning." In this instance some individual learning does occur, but the learning does not lead to organizational adaptation.
Superstitious experiential learning.

A third break which can occur in the experiential learning cycle occurs between the organizational action and the environmental response. Sometimes organizations take action but those actions fail actually to cause an environmental response, or at least the response which members of an organization expect.

![Diagram](image)

**Figure 5.** Superstitious experiential learning.

Here, as shown in figure 5, the connection between an organizational act and an environmental response is severed. Nevertheless, individuals may associate certain changes in the environment with the organizational action, inferring a causal connection when none exists. Hence, March and Olsen call this "superstitious" experiential learning.

For example, many members of the Pentagon from the 1950s to the 1970s may have believed that military spending
was good for the economy. Acting on this belief the Pentagon had little hesitation spending large amounts of taxpayers' money on the military buildup. And what did those individuals perceive as happening to the United States economy? Did it not thrive during those decades? And with whom did Pentagon officials have contact? Their contact was not with unskilled, unemployed workers in inner cities; rather, it was with prosperous contractors doing business with the Pentagon. Thus it is easy to understand why many members of the Pentagon could hold without question the belief that military spending is good for the United States economy?

The actual effect of that military spending, however, is much more open to question than members of the Pentagon might indicate. Many economists argue cogently that taxpayer monies spent on military spending, far from boosting the American economy, create fewer jobs than equivalent spending in other areas (United States Department of Labor 1975; De Grasse et al. 1982). And economists as different as George Gilder and Gordon Adams agree that defense spending spurs inflation. In the view of such economists the experiential learning of Pentagon officials in this instance would rightly be called "superstitious." It is based on the widespread fallacy of concluding that because two events are associated, there must therefore be a causal link.
Experiential learning under ambiguity.

Finally, March and Olsen identify a break in the cycle of experiential learning that occurs between the action of the environment and the accommodation of individual beliefs.

![Diagram](image)

**Figure 6.** Experiential learning under ambiguity.

Here, individuals see only dimly or indirectly what happened and why. Despite such ambiguity, however, individuals try to infer what happened and modify their perceptions and actions according to such interpretations. We have already suggested one such example in the case of a Pentagon official whose experience is only with prosperous contractors and never with unskilled workers whose opportunities for jobs and retraining may be lessened through the appropriations for capital intensive and knowledge intensive defense projects.

In this case, the individual in the Pentagon is sheltered from the full impact of the Pentagon's actions.
Or, as another example, perhaps more to the point, employees of the Pentagon working in their air-conditioned offices may be largely screened from the effects on villagers in Vietnam bombed by United States bombers. Or, as a final example, it is sometimes difficult for the Pentagon to know clearly how the Soviet Union is responding to the actions of the Pentagon. Our intelligence is in some ways inadequate. In all these instances, individuals are either screened from an understanding of the effects of their organization's actions or are forced to guess at what the results of those actions actually are.

In the face of such breaks in the experiential learning cycle, individuals continue, in March and Olsen's view, to try to make sense of their world. But lacking adequate means of testing views against reality, members provide themselves with cognitive consistency by a variety of social ploys. Individual members will tend to see what they want. Well-integrated members will like what they see; alienated members, not. Because no one can be witness to all events directly, what members learn is screened by the choice of the people they trust. But people they trust tend to be people confirming their likes and ways of seeing. Thus under ambiguity, organizations are prone to what Irving Janis called "groupthink" (1972). They provide one another confirmation of the rightness of their views and actions without real tests from reality.
Evaluation of the Model

Our concern in this dissertation is to clarify issues that must be addressed in attempts to model collective learning and to speculate on features of collective learning that may be seen in social systems in general. What then are the uses and limits of March and Olsen's model for our purposes here?

One value of March and Olsen's model is that it draws attention to the links between the beliefs and actions of individuals, the actions of organizations, and the responses of environments. This is a useful addition to Deutsch's cybernetic model described in the previous chapter. There we saw the limits and dangers of a model so abstract as to give no attention to the action of individuals. March and Olsen help fill this gap by focusing on the ways members of organizations serve organizational adaptation by changing their worldviews in response to the world's actions, and by suggesting actions for the organization at large. While March and Olsen's concern is with formal organizations, I find it plausible that individuals may fill similar roles in social systems of all kinds. Whether in a family or a nation, a social system's adaptations are surely mediated by the beliefs of its members. March and Olsen help bring attention to this obvious but important aspect of collective learning.
Perhaps the greatest value of the work of March and Olsen is to remind us that real organizations often operate under conditions of ambiguity and that despite the attempt of individuals to learn, the organization is unable to act in a way that adapts to the realities of their experience. As March and Olsen point out:

... the literature on organizational learning is rarely uncoupled from the idea that learning is adaptive. Experience is viewed as producing wisdom and improved behavior. For purposes of studying organizational learning under ambiguity it is necessary to relax such an assumption. Modern organizations develop myths, fictions, legends, folklore, and illusions. They develop conflict over myths. The connection between environmental response to organizational action and individual interpretation of that response is often weak. (1976, p. 59)

The weakness of that connection may be common for many social systems that are not the kind of "organizations" studied by March and Olsen. Thus, their perspective may be useful for understanding aspects of governmental behavior not readily accounted for in Deutsch’s "rational" model.

Indeed, all of the disjunctions described in March and Olsen's four types of experiential learning may well prove fruitful in understanding difficulties in collective learning for social systems of all kinds, not just organizations. For example, role constraints may inhibit a child's contribution to solving a family problem, and role constraints may inhibit a citizen from offering ideas on the intricacies of the arms race.

Since members of any social system fill "roles,"
March and Olsen's notion of role constrained experiential learning is likely to be useful in analyzing social systems of all kinds. Of course, the rigidity of role definitions varies immensely from one social system to another. Thus, roles in the Freeze movement may be less "constraining" than those in the kinds of formal organizations which are the objects of March and Olsen's study. Nonetheless, the notion is sure to have at least some usefulness for all social systems.

Similar observations could be noted here about the general usefulness of the three other forms of experiential learning described by March and Olsen. Their models are likely to be useful in understanding collective learning in social systems of all kinds.

We should note that March and Olsen's usage of "learning" seems usually to refer to something done by individuals, and that what is important to organizations is "adaptation." It is individuals who have "cognitions and preferences." The organization makes choices and takes actions which may or may not be adaptive, that is, responsive to the real effects the organization has on the environmental actions.

The focus on purely "adaptive," or after-the-fact experience, may not give adequate attention to the role of anticipation in learning, but that is by March and Olsen's design. Their focus is on experiential learning and grows
from their observation of the difficulties organizations have in forecasting and planning. However, the line between lessons of the past and expectations about the future is sometimes quite thin. We often articulate our sense of the past in phrases like, "If you do this, that will happen." Thus, the individual beliefs shown in the March and Olsen model are quite likely to have embedded within them expectations about the future. A full model about collective learning, it seems to me, should include some accounting of anticipatory features of individual cognition.

The benefits of model building mentioned in Chapter II are apparent in March and Olsen's model. Their model prods further modelling; their clarifications call for other clarifications. First, by building a model of the flow of effects between environmental action, individual beliefs, individual acts, and organizational acts, they have helped lay open the question of what happens when the flow between those events is broken. Second, by articulating elements and their relationship, they bring to mind in other investigators additional considerations, which in an iterative social process can contribute towards a more complete model.

For instance, March and Olsen's model of the links between the four boxes brings to mind the possibility of including in the model a further link, that between organizational actions and individual beliefs as shown
in figure 7.

Figure 7. Experiential learning about internal environment.

It is apparent that an organization's actions directly affect the perceptions and beliefs of individuals in that organization. For example, if the Pentagon chooses to reject proposals for establishing verification technologies, the people proposing those technologies will learn to propose such endeavors less frequently in the future.

My intention here is different from that diagrammed by March and Olsen's "superstitious" learning or "ambiguous learning." In those cases, real links between organizational acts and environmental acts are obscured, requiring individual learners to modify their models of the world on the basis of inadequate information. Here, my concern is with the direct effect of an organizational
act on individual beliefs.

Of course, such learning by individuals is not about the experience with the external environment which is the object of concern in March and Olsen's discussion of "experiential learning." But I suggest that learning about the internal environment is at least as important as a form of experiential learning as is learning about the external environment. It can help an organization to have a clear appreciation of its own nature, dynamics, and resources so that in making decisions it does so with a clear image of what it can and cannot do. Further, my own experience in organizations is that individuals spend considerably more attention to the nature of their organizational realities than they do to the realities of their external environment. Most employees, at least in the United States, see their rewards coming from their ability to manipulate the organization rather than from the organization's effectiveness in dealing with the external environment. It would seem that both kinds of experiential learning can help organizations be more effective.

In fact, understanding the realities of a situation requires that individuals perceive not only environmental actions but the full relationship of those actions to all factors and dynamics within the organization.

When individuals alter their beliefs without such a holistic view, there is a danger that their images will
not match the full reality. Therefore, it is important to represent the process by which all factors in the system are acknowledged in the individual "models of the world."

Another elaboration suggested by March and Olsen's model involves the nature of the environmental actions, as suggested in figure 8. First, it should be noted that March and Olsen's model focuses on those actions coming from the environment that are in direct response to the organization's action. However, there are many actions coming from the environment that are not at all in response to the organization's actions and that occur for other reasons. Nonetheless, the organization is called on to react to those extraneously induced action. Any full accounting of organizational learning should picture the process by which organizations apprehend such external actions.

Figure 8. Environmental actions can be complex and autonomous.
Though March and Olsen probably do not intend so, their model encourages us to think of the environment as unitary. But in fact, organizations are usually affected by a multiplicity of environments. Thus, for example, the Pentagon's actions affect contractors, researchers, taxpayers, welfare mothers, politicians, Nevada ranchers, allies, and enemies. A decision to build MX missiles in Nevada may enrage some ranchers and please some hawks; it may enrich cement manufacturers and impoverish people whose food stamps are cut; it may comfort Americans and engender distrust in the Russians. And as this example suggests, sometimes organizations do not pay attention to certain environments which they affect. Individuals in the Pentagon get considerable feedback from contractors but little from Food Stamp recipients.

Often different subgroups within an organization focus on different external realities. The Navy may have different concerns from those of the Air Force; Defense Intelligence may focus on different environments than the Pentagon's public relations people. Such differences in goals, concerns and perceptions of reality are part of the source of conflict examined by March and Simon in *Organizations*. Therefore, it often happens in organizations that the perceptions of environmental reality are skewed by the results of the power conflicts within organizations. It would seem, then, that an organization's
experiential learning would be adaptive to the extent that it recognizes all perceptions and manages to balance them. The complexities of this process, while a continuing part of March's discussion of organizations, are not immediately apparent in the simple, four-box model.

Despite such intraorganizational conflicts, however, there usually does exist a set of beliefs shared by virtually all members of the organization. These can include its charter, roles, strategies, tactics, procedures, memories, language, technologies, etc. Such shared beliefs and views of the world are different from the beliefs represented in March and Olsen's diagram. The shared beliefs socialize individuals, and affect their actions. Thus, they tend to set the direction and parameters of organizational choice and affect to which environments organizational members give their attention. While such shared beliefs are an implicit part of March's earlier work, they do not appear explicitly in the simple diagrammatic model of March and Olsen.

Thus, the articulation of March and Olsen's model serves to suggest elaborations which may help in the collective process of working toward a more general paradigm of collective learning. But the possibility of elaboration does not detract from the usefulness of the model as it stands. March and Olsen's model offers a clear and simple template with which to diagnose deficiencies in an
organization's learning. Someone wanting to improve an organization's learning can ask a series of questions about it based on the model. Are individuals constrained from translating what they have learned from an environment into their actions within the organization? Are actions based on experience thwarted from being considered and chosen as organizational actions? Do the organizational actions have clear causal effects on the environment? How are these ascertained? Are individuals in a position to see clearly what these responses are, and to alter their beliefs accordingly? Such questions can be of immediate practical worth to anyone attempting to assess an organization and to improve its organizational learning.

In short, March and Olsen's model, while not inclusive or complete, is useful for the insights it provides, for the new directions it suggests, and for the immediate uses to which it can be put.
CHAPTER IV
DONALD SCHON AND CHRIS ARGYRIS:
BEHAVIORAL WORLDS AND CHANGES IN ORGANIZATIONAL THEORIES OF ACTION

Background

At about the same time that March and Olsen were developing a model of organizations articulated in terms of organizational learning, another team was developing theirs. Chris Argyris, an organizational theorist at Harvard, and Donald Schon, a professor of education and public policy at the Massachusetts Institute of Technology, collaborated to develop a behavioral theory of organizational learning.

Like March and Olsen, Argyris and Schon were concerned to identify aspects of organization that inhibit organizational learning. But they focused less on the way members of organizations learn about external environments and more on how members learn about their internal organizational environment. Argyris and Schon were interested to examine the ways behaviors, rules, and views shared within an organization may limit the ability of the
organization as a whole to reflect on errors and to change its goals and strategies accordingly.

The theory Argyris and Schon produced in their book, *Organizational Learning* (1978), is the most complete yet produced about organizational learning. It is a book which directly or indirectly addresses most of the major issues involved in modeling a social system as a learning system and which offers a number of concepts which we will argue later are useful in the construction of a general model of social learning systems. Since our goal in this dissertation is the development of a general model of collective learning, in the pages below we will evaluate Argyris and Schon's model for its general worth. We will examine specific concepts as we go ending the chapter with an overall assessment of the value of the model of organizational learning as a model of collective learning by social systems in general.

The theory presented in *Organizational Learning* was long in the making. Therefore before considering *Organizational Learning* in detail it will help us to review Argyris and Schon's prior work on the dynamics of firms and public systems. This review will set the stage for a better understanding of *Organizational Learning*, and will offer some independent insights about public learning not
Donald Schon: Beyond the Stable State

Donald Schon has long had an interest in learning as a public endeavor as well as issues concerning technology and society. His interest in learning took full form in his 1971 book, *Beyond the Stable State*. Here he examined the learning of public and private institutions under conditions of turbulence. No longer, explained Schon, can institutions act as if they are in a stable state. They exist in environments which change rapidly and are sometimes turbulent. This has created stresses on many of our existing institutions which are based on assumptions of a stable state. Many institutions recognizing the rapidity of change respond with what Schon calls "dynamic conservatism" by which he means that they change just as little as possible, seeming to be flexible but aiming to maintain the status quo.

In the face of unstable conditions, institutions of all kinds are faced with the increased need to "learn". In Schon's usage, "a social system learns whenever it acquires new capacities for behavior. . ." (p. 116). Schon gives cases of such learning for a range of social systems,
including formal organizations, loose informal social systems, and government.

Organizational Learning

In his analysis of organization, Schon is concerned to identify new patterns of response that help organizations renew their ways of doing things. For short-term renewal Schon recommends breaking down organizational boundaries, bringing in "young Turks" and using underground networks to accomplish tasks that formal organizations can't.

For long-term adaptability Schon recommends a combination of three elements. The first element is the establishment of pools of competency, resource spaces which may be called upon to meet changing demands. The second element is special task forces assigned well defined jobs. These first two elements are coordinated by the third which is management, whose role it is to set the overall goals and to determine how to allocate resources to achieve them. Thus, they determine which task forces should be established and how the pools of competency should be assigned. This threefold organization, Schon believes, offers more flexibility to respond to a changing environment than does an organizational structure in which the management and resources tasks are cemented together in
an unchangeable fashion.

Schon distinguishes between what he calls the "center-periphery" model of organization and the "ad hoc" model. Schon believes that there has been a decline in the use of the center-periphery model with its centralized control and an increase in the use decentralized adhoc model. He likes to talk of his second form of organization as "existential" to connote that it responds to its current state with new choices.

Important to Schon's system is his recommendation for the increased use of people serving go-between roles. In such roles people cross boundaries between existing institutions, combining resources and needs to meet changing conditions to which the institutions as they are now constituted seem incapable of responding. The go-betweener may take the roles of broker, networker, entrepreneur, or underground activist. In all cases they perform functions which existing organizations are slow to perform.

Public Learning

While Schon was interested in learning by formal organizations, his interest also extended to broader, more societal forms of social learning. For instance, he gives
an account of the evolution of stone cutting techniques in colonial America. In this case the evolution of the technologies was inseparable from political and military needs, from the availability resources, and from the pressures of economic need. What evolved was a whole new system of architectural, technological, and economic systems of which the stone cutting technology was only one part. Or, as another example, Schon describes the "system for keeping us in clean clothes," a system composed of loosely connected small stores, huge equipment manufacturers, transportation, and social values. But the evolution of such loose systems, that is their learning, their acquiring of capacities for behavior, is largely undirected. No central agency determines how to improve such a system.

In contrast to the undirected social learning of such loose systems, the learning of government is relatively more directed. Schon calls this "public learning" which he defines as "a special way of acquiring new capacities for behavior in which governments learn for the society as a whole." Government "undertakes a continuing, directed inquiry into the nature, causes, and resolutions of our problems" (p. 117). But this, in an unstable state, carries with it the need not just to solve specific
problems, but also to "design and bring into being the institutional processes through which new problems can continually be confronted and old structures continually discarded" (p. 117).

Schon's theory of government departs markedly from most previous theories. Whereas prevailing theories were concerned with how government met specific crises, Schon is concerned to develop a theory of how government can promote a public learning process to meet a wide range of problems. Traditional theories often view policy formation as rational; Schon, as less rational and more a matter of political struggle. Some theories (as in those of Campbell and Dunn) tend to view public learning as a process of social experimentations conducted somewhat in the tradition of the physical sciences by federal policy makers. On the basis of his observations of the United States federal governmental process, Schon rejects the accuracy of such "rational/experimental" models, and offers his own alternative model of public learning.

Stages in the emergence of ideas in good currency. Many models of government tend to view ideas as arising in central government and being disseminated later to the periphery. But Schon asks where such ideas come from and tends to see them as arising as the periphery and making
their way to the center later. Schon calls this process "emergence of ideas in good currency". Ideas in good currency are ones powerful in the formulation of public policy. Governments can only handle a fairly small number of such ideas at one time since there is a limited amount of time, resources and positions of power capable of carrying such ideas. The ideas which are in good currency tend to shift over time. They must do so "at a rate commensurate with (the government's) own changing situation. More broadly, the adequacy of a learning system is in part shown by how far its ideas in good currency are adequate to the situation actually confronting it" (p. 123).

Schon's model of the emergence and change of ideas in good currency pictures a series of phases. While Schon makes clear that these phases are overlapping and not clearly demarcated for purposes of exposition we will identify six phases described in Schon's work. These are shown in Figure 9 below, which attempt to indicate the overlapping nature of those phases.

In the first phase of the emergence of ideas in good currency a given social system is "dynamically conservative," modifying its structure technology and concept as little as possible, maintaining its system of
Phases

1. Dynamic Conservatism

2. Crisis

3. New Ideas at Free Margins

4. Ideas Spread to Public

5. Ideas Attach to Political Struggle

6. Ideas are in "Good Currency"

Time

Figure 9

Phases in the Emergence of Ideas in Good Currency
ideas in good currency. Although Schon offers his own example, I will choose in the following pages to use the current example of the recent emergence of ideas about the nuclear arms race, in keeping with our concern with issues of global survival. During the 1950s, 1960s, and 1970s the United States strategy concerning nuclear policy was based on concepts and technology aimed at avoiding war through deterrence and "mutually assured destruction" (MAD). Contained in this was the assumption that the United States should continually improve its nuclear arsenal in order to be certain that the Soviet Union understood that the United States had an invulnerable and overwhelming retaliatory capacity. While this was the policy of all presidents during that period there were disarmament groups at work, promoting the idea of stopping and reversing the nuclear arms race, but such work was largely ignored so long as the "MAD" policy seemed realistic to policy makers. It is also true that during this period arms treaties were negotiated, but these did more to define the rules of the game than to actually slow the arms race. Thus the number of nuclear warheads possessed by the superpowers rose from a small number in the 1950s to almost fifty thousand by the 1980s. This period during which only minor adjustments were made to the continuing arms race might be an example of what
Schon meant by "dynamic conservatism."

The second phase of Schon's model occurs with a crisis in which events call into question the efficacy of ideas in good currency. To continue the example of arms policy, events of the 1970s conspired to call into question the "MAD" policy. First, technologies had changed in ways that made it possible to envision scenarios where one side might attack the other with preemptive first strike against the missile silos of the other side, thus calling into question the threat of retaliation on which the "MAD" doctrine depended. Second, many in the conservative United States military industrial complex began to be alarmed that the Soviet Union's buildup of large intercontinental ballistic missiles might in fact be capable of launching such a preemptive attack against the United States land based missiles, forcing the United States to capitulate for fear of destruction of its populated cities. These perceptions, combined with United States frustrations about Iran, helped to elect Reagan president on a plank of massive military buildup. The Reagan administration then began talking of waging limited nuclear war, alarming large number of citizens. A crisis in the course of United States policy had been reached--whether to respond to the new realities of the nuclear era with a new round of development of
nuclear war fighting technology, or to find some alternative approach to the arms race as a whole.

The alternative approach which was seized on was the proposal by Randall Forsberg and others that the United States and the Soviet Union agree to immediate, verifiable Freeze on the testing, production, and deployment of nuclear weapons and their delivery system. This is an example of the third phase in Schon's process of the emergence of ideas in good currency. During this third phase, ideas develop at "the free margin" of society and are seen to be applicable to the current crisis. These ideas are developed by people in "vanguard roles" - such as artists, muckrakers, utopians, philosophers and prophets. In the case of the Freeze movement, the specific proposal has been attributed to Randall Forsberg, an MIT student of international armaments and a former employee of the Stockholm Peace Research Institute. In 1979, seeing SALT falter, she began advocating the Freeze proposal as simple and acceptable enough to gain wide acceptance. In 1980 a band of long-time peace activists and Quakers in western Massachusetts managed to get proposals similar to the Freeze passed in a number of localities. The seeds were taking root but they had yet to be planted in Washington.

In Schon's fourth phase, the ideas at the free margins
are diffused to a broad public through networks, popularizers, and the media. The diffusion often involve the invasion of the source group by other groups waiting to capture the aspects of the new proposal. Thus in the case of the Freeze, the idea was rapidly diffused through existing peace, church, and professional networks. Popularizers arose, including the charismatic Helen Caldicott. By early 1982, the mass media began to recognize that the movement had intense and widespread appeal (and hence could sell advertising). As the idea spread, different localities and groups altered the original proposal to suit their own goals, but the vectors were all in about the same direction.

In Schon's fifth phase, alternative ideas become attached to political struggles in which careers and power ride on the public choice determining which ideas shall prevail. Perhaps a major reason for the success of the Freeze movement has been that it became an object for public debate and vote in countless town meeting and state referenda. Local organizations were formed to promote its passage. Public learning was no longer a theoretical inquiry; it was inquiry raised to the level of public decision.

In Schon's sixth and final phase, the ideas once at
the "free margin" are adopted by the powerful people at the center of government. The ideas are legitimated. They have become part of the small set of ideas that are "in good currency" that are commanding serious attention as solutions to actual crises. They are no longer merely ideas in the hands of kooks; they are on the verge of being considered as public policy and law. For the Freeze, this occurred swiftly. Most Washington politicians in 1982 were hardly aware of the Freeze, but as the power of the movement burgeoned, leaders left to catch up with their electorate. Kennedy and Hatfield proposed a resolution in the Senate and by the summer the resolution nearly passed in the House and did manage to pass in the Spring of 1983. The fact that the idea had become legitimate may be seen by the attempt of the opposition to delegitimize it by implying that the Freeze supporters were "dupes of the KGB" and too naive to be included in the decision about nuclear war. But by the fall of 1982 the Freeze had clearly become what Schon an "an idea in good currency." It was an issue in many congressional campaigns and was voted on by more than a quarter of the electorate in state and local referenda. The Reagan administration was acknowledging the power of the movement by the orchestration of statements against the Freeze by leading members of the Cabinet and by
the President himself. By the end of 1982, Reagan's proposal for a massive military buildup and the counterproposal for a Freeze were both "ideas in good currency" vying to become the policy of the nation in a nuclear age.

The example of the Freeze helped highlight a difference between Schon's view of public learning and that of others. Karl Deutsch, you will remember, modeled government as a central processing unit similar to that of a computer. Schon's model is an entirely different one from such rational information processing model. His acknowledges the human struggle the mix of politics in the messy process by which nations learn new ways of coping with problems.

Schon's model is also very different from models which tend to think of governmental learning as happening at the center of governmental power. It is further different from the model given by Rogers and Schoemaker who describe the diffusion of innovation as something primarily emanating from the center to the periphery. But in Schon there is much more acknowledgement given to the importance of the periphery. Says Schon, "The opportunity for learning is primarily in discovered systems at the periphery, not in the nexus of official policies at the center. Central's
role is to detect significant shift at the periphery, to pay explicit attention to the emergence of ideas in good currency, and to derive scenes of policy by induction" (p. 177).

Thus Schon's model of public learning serves as a useful counterpoint to the centrist and rational model as exemplified in the work of Karl Deutsch. He is further valuable in his attempt to offer a schemitization of the phases through which public learning is likely to proceed. And perhaps most pervasive is his acknowledgment of the existential quality of public learning as something requiring choice under uncertain and changing circumstances.

**Argyris and Schon's Theory in Practice**

Donald Schon's first collaboration with Chris Argyris came in 1974 with the publication of *Theory in Practice: Increasing Professional Effectiveness*. To this Chris Argyris, brought his many years of experience as a leading organizational theorist. He had written extensively about the relationship between interpersonal competence and organizational effectiveness (1962) and that relationship remains at the core of his eventual analysis of what
inhibits or helps organizational learning. Argyris also brought to the collaboration his use from prior works (1965) of feedback loops to model organizational behavior for instance, he modeled through such feedback loops the deterioration of a research and development organization, emphasizing the way in which interpersonal competency can lead to conditions that impede the effectiveness of the organization's Research and Development and which reinforce those varying dysfunctional interpersonal behaviors. Such feedback loops become an important part of Schon and Argyris's analysis of organizational learning. In Theory in Practice, Argyris and Schon develop another element central to their eventual model of organizational learning—the concept of theories of action. They see humans as constructing theories of what to do under various circumstances. Schematically a theory of action says, "In situation S, if you want to achieve consequence C, under assumptions a...n, do A" (p. 6).

Argyris and Schon distinguished two kinds of theories of action—"espoused theories" and "theories-in-use." An espoused theory is one which someone says he follows; a theory-in-use is the one he actually follows. These are not always congruent, and the person may be unaware of the incongruence since the theory-in-use has passive dimension
which can only be inferred. It is theories-in-use which command more of Argyris and Schon's attention, for such theories determine what organizations actually do.

Because theories of action, and especially theories-in-use, are so important to Argyris and Schon's theory of organizational learning we will pause here to consider certain ramifications of this point of view. The formulation given above is so bare that it is important to realize some of its implications, for the point of view chosen is bound to determine what a theory of organizational learning will stress, and what it will ignore.

We might first note that these theories of action are inferred rather than observed directly. This puts a special burden on the inferer. What one person infers another person may not. There may be some who dislike this reliance on inference. For my part I have few reservations about this procedure. It is the one followed by Piaget and many other cognitive psychologists in studying individual cognition and I see no compelling reason not to rely on inference in examining organizational learning. Questions of how to go about such inference and how to make claims of universal validity are ones discussed earlier in chapter II.
We should also note that Argyris and Schon's view sees humans as theorizers as creatures who put together strategies for action, but these strategies are not automatically arrived at. They are the work of learners who have constructed a certain view of reality. While Argyris and Schon do not discuss such issues, they are imbedded in their view. Any view of learning or organizational learning necessarily rests on a theory of knowledge and truth.

It is also worth stressing that Argyris and Schon's concern is with action. They are not concerned with other forms of less active learning such as ones involving reflection or the acquisition of knowledge and understanding or in the search for truth and beauty. Their concern rather fits the concern of practical businessmen whom organizational theorists serve. But one may question whether a theory of action is a complete theory of learning, one accounting for less active forms of learning. For instance, the acquisition of knowledge and the search for truth and understanding may follow more contemplative and reflective forms of activity than those followed by decisive businessmen. Scientists may respond to different imperatives than technologists (Polanyi 1962). Of course Argyris and Schon argue that a theory whose goal is action
must be based somehow on theories whose goal is understanding. Nonetheless the focus in organizational learning here is on organizational learning aimed at action and only secondarily an organizational learning aimed at understanding.

Associated with Argyris and Schon's concern with action is their stress on consequences. They are very much in the American pragmatic tradition. That tradition, as expressed variously in the works of William James and John Dewey among others, tends to hold that the test of a belief or theory is in its practical consequences. While we do not have room here to discuss the merits of that widely held view, we should at least note that there are many who put less stress on consequences as the test of belief. Michael Polanyi, for instance, argues that the pragmatic concern with consequences is in many ways at odds with the true nature of science. Scientists, he argues, follow heuristic urges, personal hunches resting on personal commitments, long before the facts of experimental consequences justify such hunches. The tests of a scientific theory in his view include such things as coherence, breadth and beauty, and less on the test of consequences.

Another feature of Argyris and Schon's formulation
worth emphasizing is the situational nature of theories. This too is in some ways in the pragmatic tradition. For instance, John Dewey frequently reminded us that there is no final separation between the knower and the known nor between the environment and the environed. Similarly, one does not sense that Argyris and Schon expect members of organizations to be establishing absolute and immutable truths, or to be discovering a priori knowledge independent of experience. Their concern is with what to do in the flux of organizational experience. This pragmatic cast of Argyris and Schon's view of theories of action in many ways determines the strengths and limits of their eventual theory of organizational learning.

Organizational Learning: A Theory of Action Perspective

Organizational theories of action

Argyris and Schon build on the concept of theories of action to give their major account of organizational learning in their 1978 book, Organizational Learning: A Theory of Action Perspective. They argue that just as the theory of action can be inferred from an individual's behavior so can one be inferred from an organization by its behavior (p. 13). Organizational behavior is composed of
decisions and actions carried out by individuals governed by collective rules. An organization's theory of action, then, is made up of the norms, strategies, and assumptions imbedded in its practices (p. 14). For example, a semiconductor firm has certain norms about quality, certain strategies for assuring quality (e.g. training new employees) and certain assumptions linking strategies to norms (e.g. that a fixed sum for training per year is adequate).

Organizational learning is the correction of error

The norms, strategies, and assumptions of an organization's theory of action are supposed to achieve organizational goals. But when outcomes do not match expectations, a condition of "error" exists. Organizational learning, as defined by Argyris and Schon, is the detection and correction of such error. Error usually results from changes in the internal and external environment of the organization. As an example, if the above semiconductor firm failed to meet its quality control standards, found out why (e.g. increased worker turnover), and made changes in procedures (e.g. more money for training) so that its standards were met, "organizational learning" could be said to have occurred.
Thus we can see that the pragmatic framework which Argyris and Schon applied to the individual learning is brought to bear on organizational learning. Their focus will be on practical consequences, and not on less active practical forms of learning. Further the stress on response to error runs the risk of reducing organizational learning to a mechanical model of learning. This may limit the range of behaviors included in Argyris and Schon's model. It excludes the kind of "heuristic urges" Polanyi sees as motivating the learning offered by scientists. It may even ignore the kind of indigenous play and tinkering offered by inventors. Such behavior is not adequately described by response to error alone. And if this is true of individuals, it may well be true of organizations. Healthy businesses do not simply respond to error; they also create and recognize opportunity. They develop new products, and perceive new markets. Argyris and Schon's model is successful at describing the more bureaucratic and conservative aspect of an organization. It may not, however, be as successful in describing the more entrepreneurial and inventive aspects of organization.

Individuais are agents of organizational learning

This pragmatic organizational learning does not happen
in a vacuum—its agents are individuals. It is they who recognize, for example, that the chips produced by a semiconductor firm fail to meet expectations of quality. It is they who inquire into the causes of error, invent solutions, and make them a regular part of subsequent organizational practice.

Organizational learning as change in shared map of organizational theory-in-use

However, if individuals detect error but fail to imbed solutions in the organization's theory-in-use, only individuals will have learned, not the organization. "Individual learning is a necessary but not proficient condition for organizational learning" (p. 20).

Organizational learning, in Argyris and Schon's phrasing, requires that "learning agents' discoveries, inventions, and evaluations must be imbedded in the organizational memory. They must be encoded in the individual images and shared maps of organizational theory-in-use from which individual members will subsequently act" (p. 19). By "shared map," Argyris and Schon mean "public representations of organizational theory in use to which individuals can refer" (p. 17). They include such things as diagrams of work flow, office layouts, and statements of
procedures. They are the meshing of scattered individual images of organization which once pieced together become "...guide to future actions by members of the organization. As musicians perform their scores, members of an organization perform their map" (p. 17). Organizational learning results in the alteration of these maps.

It cannot be emphasized enough here that a subtle but important distinction has been made here, a distinction to which we will return in later discussions. For Argyris and Schon see organizational learning as not merely the sum of individual learning; rather they see organizational learning as a change in something we might call "supraindividual," a change in a shared map of the theory-in-use inferred to govern the behavior of members and their organizations as a whole. Scattered individual learning has somehow been brought to the level of a change in something organizational--the organizational theory-in-use.

Another aspect of Argyris and Schon's view worthy of note is the highly suggestive quality of speaking of organizations as creating "theories." The latent image, not pursued by Argyris and Schon, begins to approach those of the mystic Tielhard de Chardin in his view of the "noosphere" and of Hegel's "Spirit" coming to know itself.
Organizations are theorizers. They are entities which try to come to grips with the realities within which they act. Individuals are the agents of that learning. But organizational learning is richer than individual learning. It is almost as if the organizations are theories of the world, are ideas of reality.

The more apparent value of Argyris and Schon's model, however, is that they have articulated such a clear and consistent definition of organizational learning that further discourse is made easier. Organizational learning is seen as a pragmatic endeavor, in which members detect that outcomes have not met expectations, and reflect together until they have changed their shared map of the organization's strategies, assumptions, and goals.

**Stages in organizational inquiry**

Argyris and Schon do not consider that every change in the shared maps qualifies as learning. Some changes may result by fiat, force, ecological eruption, or chance. These lack the cognitive quality which distinguishes learning. Organizational learning, by their definition, is the result of inquiry.

They schematize that inquiry has a cycle consisting of four phases as shown in Figure 10. (In some of Argyris
and Schon's descriptions the last of these four phases is broken into a number of further phases. We will use the four phase model here.

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**Figure 10**

Phases of Inquiry
For the discoveries and inventions of individuals to bring about organizational learning, they must be produced, evaluated, and generalized by the organization. That is, they must become a regularized part of the organization's map and practices. As such they are unaffected by the departure of the original inventors, and become a standard part of the socialization of new members. Such regularization marks the completion of a cycle of organizational learning.

"Organizational dialectic," or the cycle of inquiry, is continuous

Figure 10 above also diagrams the never-ending nature of organizational learning, in which the solution to one problem gives rise to the next. Thus the new strategies, assumptions, and norms regularized as a part of an organization's theory-in-use are sure to beget their own dilemmas or errors which must be met by a subsequent cycle of organizational learning. Argyris and Schon called this "organizational dialectic," stressing the continual conflictual nature of this process (p. 42).

Since the term "dialectic" is a permanent part of my own model of collective learning, I should note that their usage of the term is very different from that I developed
earlier (McClellan 1978). Theirs is concerned with the cycles of the problem solution problem process. Mine is concerned with the interplay of individual learners, their supra individual lesson sets, and their environing realities.

Returning to Argyris and Schon, they see an organization as having "good organizational dialectic" when the members are continually open to recognizing and solving conflict. This is characterized by the willingness to test for errors and incongruities, to inquire into the nature of conflicts, and to overcome them in a satisfactory way (pp. 144-146).

Limits of stage schemes

The notion that there may be stages in the process of inquiry is hardly new, nor is this particular schematization as presented by Argyris and Schon. Elements of it can be found implicitly in discussions of science since the time of Bacon. For instance, John Dewey's discussions of problem solving in Logic: The Theory of Inquiry (1924) contains similar elements. What is useful here is the attempt to apply such analysis to inquiry that is organizational rather than individual. It would be desirable for an eventual general model of collective
learning to continue such attempts to clarify analytically separate stages.

However I find myself wondering if the process of inquiry is quite so neat and linear as presented in this chart. My own experience of inquiry, and the accounts from works such as Ghislin's book *Creativity*, Kuhn's *The Structure of Scientific Revolutions*, and Polanyi's *Personal Knowledge* all attest to the messy, multivariate, back-forth-many-stages-all-at-once-nature of inquiry as it actually proceeds within individual inquirers. If this is true of individuals, it seems even more likely to be true of collections of individuals. While some individuals may only be "discovering" organizational error, others may already be "inventing" solutions. And, as a whole, an organization may often perform a number of functions simultaneously. The actual cauldron of organizational politics is much more full of bubbles and blobs than is represented by the chemical equations of the lab.

This is not to say that Argyris and Schon would disagree that the actual process of organizational inquiry is messier than their idealized pattern suggests. Remember that Schon in *Beyond the Stable State* saw public learning as a vast complex process with overlapping stages. I mean here, rather, to stress that while a schematization of
stages may be useful for analytic and linguistic purposes, it should be viewed with caution as a full representation of reality.

**Single-loop learning and double-loop learning**

One of the best known distinctions made by Argyris and Schon is that between two kinds of organizational learning, each changing a different aspect of the theory-in-use. In "single-loop learning," it is the strategies or assumptions that are modified; in "double-loop learning," not only are the strategies and assumptions modified, so are the norms, goals, and objectives of the organization. Argyris and Schon called the former "single-loop" because only one feedback loop is involved—that which links the detection of error to the strategies the organization uses in forming its goals. "Double-loop learning," in contrast, involves a second feedback loop which links the error to the very norms which define effective performance.

An example of single-loop learning might be the case mentioned above of a semiconductor firm correcting a drop in the quality of its product. Here there was no change in the company's norm—only a change in the assumption about the amount of money required to adequately train the workers.
But consider the more difficult learning recently required many United States semiconductor firms when they began losing large shares of the market to Japanese competitors. Examination of the causes revealed among other things that the Japanese were delivering much more reliable chips and that the old United States standards of quality control were simply not good enough. For United States firms to compete, they needed to raise quality standards. But actually to meet much higher standards, corporate quality control strategies needed revamping, giving rise to suggestions to such structures as "quality control circles" modeled after those of the Japanese. Also important to the Japanese firms were systems guaranteeing lifelong employment and indexing of an employee's pay to yearly corporate performance. For United States firms to adopt such "strategies" actually implied alteration of central United States norms about worker participation and control. These in turn were in conflict with older norms about management control and the division of profits. Thus many United States firms have been involved in a learning process that pervades their organization's theory-in-use, affecting not only assumptions and strategies but central norms as well. This would be an example of what Argyris and Schon called double-loop learning. But unlike the
straightforward single-loop learning which focuses on increasing effectiveness without changing central norms, double-loop learning is difficult, requiring the understanding and resolution of conflicts between members holding different norms. Such conflicts, which are usually treated as undiscussable, need to openly discussed if double-loop learning is to be achieved.

Deutero-learning

Argyris and Schon distinguish a third kind of organizational learning which is one level more general than either single-loop or double-loop learning. Whereas those involve learning ways of correcting specific errors, "deutero-learning" involves learning about organizational learning in general. It is second order learning, connecting errors in the way an organization's theory and use detection corrects its first order errors. Deutero-learning is reflective, requiring that members examine prior context for learning to discover what helps or impedes organizational learning. Like all other kinds of organizational learning, deutero-learning requires a complete learning cycle of the sort shown earlier in Figure 10. It ends with the regularization of new practices in the organizational maps and theory-in-use.
This distinction is not new to Argyris and Schon; Edgar Dunn (1971) discussed "learning to learn", and Gregory Bateson (1972) draws on one of his early articles which used he termed "deutero-learning." But the familiarity of the notion does not belittle its value; it focuses our attention on the processes which social systems learn about their learning in general. It is this notion which we have earlier abbreviated as "\((CL)^2\)," or collective learning about collective learning. It is of that process that I hope this dissertation may be a part.

**Behavioral worlds**

If organizational deutero-learning is to be successful say Argyris and Schon, members must examine how an organization's habitual styles of interpersonal interaction affect the organization's capacity for learning. Argyris and Schon call these characteristic styles "behavioral worlds." They include the language, norms, and strategies for interpersonal actions that typify an organization and permit it to be described by such terms as "defensive" or "openend," "cautious" or "experimental." If organizational learning is a matter of bringing together individual's scattered perception of error and collectively imbedding new procedures in the organization's theory-in-use,
then clearly the quality of interpersonal relations can have a great impact on the quality of organizational learning. For that reason, most of Argyris and Schon's attention in *Organizational Learning* is devoted to the study of different behavioral worlds and their effects on organizational learning.

The importance of behavioral worlds can be sensed first by considering the conditions that give rise to error and the responses required to correct conditions, as summarized in Figure 11.

In order for the corrective responses in Figure 11 to be carried out members of the organizations must collaborate. But the quality of collaboration will depend on the nature of the behavioral worlds that the members inhabit. For instance, consider the case mentioned above of the semiconductor firm meeting higher standards of quality control. Some members may advocate quality control circles, but their norm of greater worker participation may be in conflict with some other members' older norm of tight managerial controls. Or some may advocate greater profit sharing, but this may conflict with the norms of those who view profits as reserved for investors. In order for the firm to deal with these incompatibilities, members must be willing to surface the conflicts and resolve them. But the
<table>
<thead>
<tr>
<th>Conditions for error</th>
<th>Corrective responses*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mistaken assumption</td>
<td>Reformulate</td>
</tr>
<tr>
<td>Incongruity</td>
<td>Reconcile</td>
</tr>
<tr>
<td>Incompatibility</td>
<td>Resolve</td>
</tr>
<tr>
<td>Vagueness</td>
<td>Specify</td>
</tr>
<tr>
<td>Ambiguity</td>
<td>Clarify</td>
</tr>
<tr>
<td>Excess/sparseness</td>
<td>Prune/enrich</td>
</tr>
<tr>
<td>Untestability</td>
<td>Make testable</td>
</tr>
<tr>
<td>Scatter</td>
<td>Concert</td>
</tr>
<tr>
<td>Information withheld</td>
<td>Surface</td>
</tr>
<tr>
<td>Information kept important for action</td>
<td>Bring into good currency</td>
</tr>
</tbody>
</table>

*Corrective responses to conditions for error may be inhibited by the behavioral world of the organization.

Source: Argyris and Schon, 1978, p. 59

Figure 11
Conditions for Error

behavioral world of the firm may shun such conflict. The theory-in-use of members may have as a governing norm the avoidance of open interpersonal confrontation. Therefore, the organization may not even surface the incompatible options in the first place. Instead, members may ignore the problem, and seek less fundamental ways of approaching
the quality control problem. That is, the modes of interaction characterizing the behavioral world of the firm would have inhibited the firm's double-loop learning.

Case studies and ethnography

Argyris and Schon construct elaborate models of two different behavioral worlds and of their effects on the capacity of an organization to learn. But before we go on to consider those models, we will first pause to examine the methods by which Argyris and Schon study behaviors, collect their data, and construct their models.

Argyris and Schon's method is the "case study" method often used by organizational theorists. Some of the dozen or so cases Organizational Learning are drawn from Argyris and Schon's own extensive experience as consultants and researchers. Some of their data comes from tape recordings of their interventions as consultants. Other cases are apparently based on accounts written by members of the authors classes. Still other cases are drawn from the organizational theory literature. The diversity of cases is one of the strengths of the book, a strength hard to convey in a synopsis. One gets some sense from the cases of what is meant by the general models.

An acceptable model paradigm of collective learning by
social systems in general will only emerge if researchers from different disciplines report their findings and procedures with sufficient texture and detail to persuade each other that their findings are indeed commensurable, and that there are valid commonalities to be found in the learning observed in a wide variety of social systems. Without such solid detailed description, researchers will suspect that claims to generalizations arise more from the imagination of the model builders than from the reality whose diversity the models purport without proof to match. So paradoxically, the richer the description of detail, the more likely the acceptance of claims of generality.

Such questions of methodology have already been carefully thought through by ethnographers. Glaser and Strauss (1967) have shown techniques by which theory can be grounded in observation. Clifford Geertz (1973) has called for "thick description" so rich in concrete observations of an entire context that the researchers can feel confident in comparing the observed context to another. Egon Guba (1980) delineates a set of rigorous methods by which a researchers naturalistic observations can achieve trustworthiness in the eyes of others. These methods include such techniques as prolonged observation and collection of raw data for the establishment of
credibility; random sampling and thick description of context to establish a sense of fit; use of self audit trails to establish dependability of analysis; and triangulation to establish confirmability.

By the standards of ethnographers, Argyris and Schon are partially successful in at least one case— that of a major chemical company. In that study by one of the authors, the analysis was sufficiently long, intense and detailed to establish credibility. But even in that case, the author does not give us an audit of his own process of observation and analysis, nor sufficiently rich raw data to be entirely convincing that his conclusions are valid generalizations. I have even stronger reservations about the cases based on reports done by students in the authors' classes. True, these cases all give detailed accounts of conversation between the reporter and someone else in that person's organization. An excerpt of such a case is given on the following page in Figure 12. However, we are not given much more than a dialogue and private thoughts; the complexities of the setting, the nuances of body language are left out. What is reported is done so in recollection well after the events. Of course Argyris and Schon do give much richer description than many other organizational theorists, whose tradition often values the kinds of charts
Theories-in-use manifested by individuals in the cases, and to comment on their effectiveness. The resulting discussions were tape-recorded and, in some instances, transcribed.

**CASE 1: CARLOS**

A man we will call Carlos, co-manager of a technical institute in a developing country, wrote the following case.

Carlos's organization carries out a program in food technology. The Institute's objective is to create capacity for solving technological problems in the production of tropical fruits and vegetables—training technical staff, constructing pilot plants, establishing laboratories, developing regional research programs, and providing technical assistance to local industry.

The program staff is made up of a group of international experts, drawn from an international organization, and a local team of counterpart technicians. The group is divided into several sections, such as horticultural production, post-harvest storage, processing, engineering, quality control, and marketing.

For each international expert in the program, there is at least one local counterpart. Carlos is the local counterpart of the Program Manager.

In this case, a local company wants to diversify its product line, and has requested the Institute's assistance.

**Carlos and Program Manager**

Carlos: How would you handle this one?

PM: Well, I don't know. Maybe we should assign it to A, because he has been visiting that plant and is familiar with the equipment.

Carlos: Yes, but I think that in spite of A's great experience, the others should be given a chance to express their opinions. The problem involves knowledge which A may not have.

**Carlos's thoughts**

He never makes quick decisions or gives his own opinion. As I expected.

**Carlos and B**

Carlos: (Handing B a letter)

Any suggestions about this project?

B: I heard about this request. I was wondering if you were once again going to make a unilateral decision.

Carlos: I think we should give the company a feasibility proposal to study any of the 20 products they consider potentially good.

B: We have to decide once and for all on our priorities. Requests like this will happen more often from now on, so we should make up our minds about the fruit products we should advise. All of us, in a meeting, should resolve this. I think we should list the products we prefer, for reasons each section will give, and then eliminate products on the original list.

Carlos: What would you say to brainstorming a list of products and a list of criteria, and then judging the products on the basis of some grading system?

**Carlos and A**

Carlos: Would you be in favor of going through a brainstorming session to develop a list of

**Carlos's thoughts**

Let me see what B thinks. He makes his position very clear.

I don't like what he says or the way he says it. This is not what I asked.

Yes, he is right. And I share part of the responsibility for not having done this already. But only I know how much workload I have, and how many problems I have already solved.

I am supposed to be leading how to lead this group with the PM. Yet all the initiative is left to me.

This is what I'm going to do.

**Carlos and A**

Carlos: I already know what he is going to say. He is the only one who knows the truth.

**Figure 12**

Case Study
and boxes which give busy executives a quick handle on the chaos they face. That is fine for action, but for the development of grounded scientific theory capable of commanding trust across disciplines, my own taste is to want more. Here it seems to me is an example of an occasion on which a sharing of methodological perspectives across disciplines could greatly further the quest for a theory of collective learning that is both scientifically sound and practically useful.

My reservations about the way Argyris and Schon report their observations does not mean that I consider their models to be of no worth. Far from it. I am confident that their models emerge from a wealth of experience, even if not articulated. Further, as aids to further observation, the concepts and classifications in their models are invaluable. Their stated goal has been to aid in the "mapping" of organizational learning. It is a goal which they have achieved.

Model I theory-in-use

Let us return then to the behavioral worlds which Argyris and Schon see. On the basis of their wide experience as consultants to business, education, and government, they offer a model of the theory-in-use held by
Model I Theory-in-Use

<table>
<thead>
<tr>
<th>Governing variables</th>
<th>Action strategies</th>
<th>Consequences for behavioral world</th>
<th>Consequences for learning</th>
<th>Effectiveness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Define goals and try to achieve them.</td>
<td>Design and manage the environment unilaterally. (Be persuasive, appeal to larger goals, etc.)</td>
<td>Actor seen as defensive, inconsistent, incongruent, controlling, fearful of being vulnerable, withholding of feelings, overly concerned about self and others or underconcerned about others.</td>
<td>Self-sealing.</td>
<td>Decreased long-term effectiveness.</td>
</tr>
<tr>
<td>Maximize winning and minimize losing.</td>
<td>Own and control the task. (Claim ownership of the task, be guardian of the definition and execution of the task.)</td>
<td>Defensive interpersonal and group relationship (dependence on actor, little helping of others).</td>
<td>Single-loop learning.</td>
<td></td>
</tr>
<tr>
<td>Minimize generating or expressing negative feelings.</td>
<td>Unilaterally protect yourself. (Speak in inferred categories accompanied by little or no directly observable data, be blind to impact on others and to incongruity between rhetoric and behavior, reduce incongruity by defensive actions such as blaming, stereotyping, suppressing feelings, intellectualizing),</td>
<td>Defensive norms (mistrust, lack of risk taking, conformity, external commitment, emphasis on diplomacy, power-centered competition and rivalry).</td>
<td>Little testing of theories publicly.</td>
<td>Much testing of theories privately.</td>
</tr>
<tr>
<td>Be rational.</td>
<td>Unilaterally protect others from being hurt (withhold information, create rules to censor information and behavior, hold private meetings).</td>
<td>Low freedom of choice, internal commitment, and risk-taking.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Argyris and Schon, 1978, pp. 62-63

Figure 13

Model I
most members of most organizations. As shown in Figure 13, "Model I" describes the personal theory-in-use that governs the interpersonal behavior of individual members of virtually all organizations Argyris and Schon have encountered. The left column in Figure 13 lists typical norms or objectives that govern individuals' behavior. The next column identifies strategies typically used to achieve those norms. The middle column lists the effects such norms and strategies have on the climate within which members interact. The next column summarizes the effects of such a climate on organizational learning. And the last column gives the result: reduced organizational effectiveness.

Inhibiting loops

Argyris and Schon describe the difficulties which the Model I behavioral world produces for attempts at organizational learning. The most important of these they call "primary inhibiting loops" (p. 46). These are loops in the sense diagrammed in the Figures 14 and 15. That is, the conditions for error (listed earlier in Figure 11) cause individuals to behave with one another in a way that inhibits organizational learning. The typical modes of interpersonal behavior, in turn reinforce those conditions
for error, in a self-sustaining cycle that limits the ability of the organization to detect and correct errors. Argyris and Schon call such loops "primary" to indicate that they involve the all important interpersonal dynamics of individual members. But such primary loops can engender "secondary inhibiting loops," ones involving the dynamics between subgroups of the organization (p. 109).

Figure 14
Example of an inhibiting loop

Figure 15
Inhibiting loop
Model I theory-in-use limits organizational learning

The effect of the Model I theory-in-use is to limit the organization's learning system. Defensive interpersonal strategies mean that individuals avoid open confrontation and are unlikely to test openly aspects of their theories of action, such as the assumptions, strategies, and norms governing interpersonal behavior. When members' assumptions and views are not discussed openly, there is no opportunity for them to be disconfirmed and corrected. Instead, members hold theories of action which remain untested, and self-perpetuating. Argyris and Schon call such privately held theories "self-sealing". Their cost is to avoid the kinds of information that could lead to learning.

The Model I theory-in-use does not necessarily inhibit single-loop learning, that is, the alterations of assumptions or strategies. As long as such learning does not create conflict within the Model I governing variables, the strategies and assumptions can be changed. But the Model I theory-in-use is bound to inhibit double-loop learning, which by definition entails conflict between people supporting different norms. But conflict is at odds with the Model I demand that negative feelings be kept
hidden. So long as members hold to that conflict-avoiding behavior, double-loop learning is impossible. The more central the norms in conflict, the less able a Model I theory-in-use is able to deal with this conflict.

Model I theory-in-use creates similar inhibitions on attempts to encourage organizational "deutero-learning." Such learning to learn requires shared reflection on the inadequacies of the existing norms, strategies, and assumptions. But this reflection creates the kind of negative feeling, uncertainty, and conflict which Model I avoids. Further, deutero-learning requires joint inquiry in which members gather together scattered impressions of organizational dynamics. Once again this is prohibited by Model I which offers members no guides or collaborative inquiry into uncomfortable topics.

Argyris and Schon offer a number of case histories which exemplify the many ways in which existing organizations capacity for learning is inhibited by the Model I theory-in-use. We cannot review here their complexities, but will simply reproduce the charts Argyris and Schon present to summarize the dynamics of such limited learning systems. Figure 16 and 17 give the general model of organizational learning constrained by Model I individual theories-in-use. They call this model of most
existing organizations the "Model 0-I" to distinguish it from a second ideal model which we will describe below.

Source: Argyris and Schon, 1978, p.110

Figure 16
Model 0-I: Limited Learning Systems
Figure 17
Model O-I: Detailed flow in limited learning system
The Model O-I learning system is capable of correcting errors which are not too threatening to members. But it is incapable of dealing with errors whose detection and correction threaten central norms of the organizational theory-in-use. Since these require revision from time to time in a changing world, long-term organizational effectiveness suffers.

"O-II" Learning Systems. To overcome the limitations of the common Model O-I organizational learning system, Argyris and Schon first envisage an ideal organizational learning system, and then suggest ways to work towards such an ideal. The model they envisage (called Model O-II) is not one they have ever encountered; rather, it is description of an organization constructed on principles more likely to permit the organization to "double-loop" learn and to "deutero" learn.

An effective learning system would require that individuals follow a theory-in-use that allows them to jointly inquire into the conditions for error listed above in Figure 11. Argyris and Schon present a model of such a theory, the Model II theory-in-use shown in Figure 18 on the following page.

In contrast to Model I's minimization of negative
### Model II

<table>
<thead>
<tr>
<th>I</th>
<th>II</th>
<th>III</th>
<th>IV</th>
<th>V</th>
</tr>
</thead>
<tbody>
<tr>
<td>Governing variables for action</td>
<td>Action strategies for actor and toward environment</td>
<td>Consequences on behavioral world</td>
<td>Consequences on learning</td>
<td>Effectiveness</td>
</tr>
</tbody>
</table>

| Valid information | Design situations or encounters where participants can be origins and experience high personal causation | Actor experienced as minimally defensive | Disconfirmable processes | Increased effectiveness |
| Free and informed choice | Task is controlled jointly | Minimally defensive interpersonal relations and group dynamics | Double-loop learning | |
| Internal commitment to the choice and constant monitoring of the implementations | Protection of self is a joint enterprise and oriented toward growth. | Learning-oriented norms | Frequent testing of theories publicly | |
| | Bilateral protection of others | High freedom of choice, internal commitment, and risk-taking | | |

Source: Argyris and Schon, 1978

**Figure 18**

Model II Theory-in-use
feelings and avoidance of public testing of theories, Model II's interpersonal behavior encourages public testing. Whereas Model I begat private, self-sealing views, Model II begets views stated clearly enough to be discomfirmable by others. And whereas the defensiveness of Model I's behavioral world limited learning to unthreatening single-loop learning, under Model II members mutually support one another in taking the risks required of double-loop learning.

The organizational learning system which Argyris and Schon think would be engendered by a Model II theory-in-use is diagramed on the following page in Figure 19.

You and me as ends and means

There may be something revealing in the way Argyris and Schon laid out their chart describing their ideal Model II theory-in-use. There is a sense, in our culture of reading from left to right, that the final goal of the patterns described in the Figure 18 is the "increased effectiveness" listed in the right hand column. This, once again, is firmly in the common American pragmatic tradition. And it is, of course, a central goal of most organizational theorists.

Nonetheless, on reflection, I am left feeling
Facilitating Error Detection and Correction

Source: Argyris and Schon, 1978, pp. 142-143

Figure 19
Model O-II Learning systems
uncomfortable about the view of people in this model. At first, I applaud the picture of an open, non defensive organization in which actors have "bilateral protection of others." But on examination this seems for Argyris and Schon do be a secondary instrumental value. The final value is organizational effectiveness. This is a different value than that contained in Kant's stricture that persons be treated not as means but as ends themselves. Nor is it the same as Jesus's plea for "agape," for care that does not tally benefits and costs. Behind Argyris and Schon's model one senses there is utilitarian view of men, one treating persons as instruments of labor for the purposes of organizations in the late twentieth century.

In the terms used by Argyris and Schon, there may be a conflict between different "governing variables" contained in their model. On the one hand, they seem to desire a radical transformation of interpersonal behavior toward greater trust and mutual support; on the other they seem to serve the instrumental values of the status quo. Any current model of collective learning must wrestle with similar issues.

The worth of such models

Some readers may feel that such an instrumental view
of humans is shown in Argyris and Schon's use of charts and boxes. And some may grow glassy-eyed in the face of Argyris and Schon's complicated charts and models. Sometimes it is difficult to understand those models and to know whether they refer to anything real. The reality of organizations is much more messy and human than the boxes suggest. Argyris and Schon would agree.

But the purpose of models is not to claim complete and final understanding of reality, but rather to aid in the growth of at least partial understanding. Models give us ways of looking at the world, of ordering chaos. Someone starting out cold in the study of "organizational learning" would be forced to spend time coming up with some categories by which to capture at least part of reality. Thanks to Argyris and Schon's models, there is no need to start cold.

The area in which Argyris and Schon's models are most useful is the area of interpersonal behavior of members of an organization. This is their major contribution to an understanding of collective learning. They have shown with precision the manifold ways in which shared styles of interpersonal behavior may effect learning by the organization as a whole.

It must be admitted, however, that this careful
examination of the internal organizational environment has been at the expense of an examination of other environments affecting an organization. Argyris and Schon have described well the factors affecting an organization's ability to learn about its internal workings. But they have said relatively little about the impact on organizations of changes coming from outside, such as changes in practices of competitors or allies, changes in the physical environment, or in the economy. And nothing is said about the intrapsychic and spiritual aspects of being, which, I will argue later, are important to a complete understanding of ourselves and our operations together in complete social systems. All the above realities may affect how an organization learns, and they are realities about which an organization must constantly learn if it is to sustain itself in its changing environmental realities. Of course, Argyris and Schon may feel that by focusing on situations in which outcomes do not match expectations, they are incorporating messages about all relevant environmental realities. That may be true, but nonetheless the fact remains that the conditions of error that receive the bulk of Argyris and Schon's attention are those conditions internal to the organization itself. A complete model of collective learning would need
to say more about the impact of external environmental realities on collective learning.

**Intervention**

The Model O-II learning system, although a theoretical construct, serves a practical purpose—it is a normative model of the goal state members of an organization can strive for when they embark on an effort to improve their organizational learning. Members will also need a map of their existing learning system, to clarify the systems dynamics that currently limit learning. Finally, members will need a model of how to make the transition from the existing learning system to a better one.

Argyris and Schon think it unlikely that an organization can provide these three elements without the help of an outside "interventionist" skilled in organizational learning. Such an interventionist can provide a model of the goal, help map what exists, and guide the transition. Without a skilled interventionist, the members of an organization are likely to continue the Model I interpersonal behaviors that obscure the information needed to detect and correct errors in the existing learning system.

Argyris may be right about the necessity of an outside
interventionist. But my reaction, is to despair that enough such interventionists could ever be bred to bring about a rapid transformation in human collective learning. Instead, I hold the hope that ideas like Argyris and Schon’s can travel faster than consultants, and that learners can recognize ideas' worth and use them on their own for self-transformation.

Argyris and Schon’s descriptions of the transition process tend to follow the discovery-invention-production-generalization pattern shown earlier in Figure 10. But, say Argyris and Schon, learning how to accomplish each of these four steps will in turn involve a complete cycle of its own as shown in Figure 20 on the following page. Thus members will need to discover how to discover, invent ways to discover, produce ways to discover, and generalize or regularize those patterns of discovery. Only then will the learning about discovery have become embedded in individuals' images and organizational maps.

Such a diagram may be useful for analytical and diagnostic purposes. Nonetheless, there is a danger of taking diagrams too seriously. For instance, one wonders if one could have an infinite regress of analytical loops.

Key to the process of intervention is the creation of a "diagnostic map" by the members of the organization and
Source: Argyris and Schon, 1978, p.141

Figure 20
Learning to double-loop learn

the interventionist working together. This brings together scattered and previously private impressions and data into a single coherent picture of the organization's learning system. It helps members see how the organization is inhibited in its learning, as well as the degree to which members were not even aware of such limitations.

Argyris and Schon recommend beginning this mapping
with a "census of the problems" (p. 178), assessing the
degree to which the problems are accessible, defined, and
solvable. Then Argyris and Schon have clients complete
detailed, firsthand case studies. These may be written, in
which case Argyris and Schon ask clients to record both
what is actually said between members as well as what the
recorder thought privately. (This helps to clarify
differences between espoused theories of action and
theories-in-use, and between what is discussable and
 taboo.) If written accounts are impractical, tape
recordings of problem-solving meetings can be used. In any
case, case studies should offer directly observable data,
not secondary categories as are given by some
questionnaires. This primary data, then, can be used to
reveal the nature of individual theories-in-use, the norms
and strategies forming the behavioral world. This in turn
permits identification of the "primary loops" that inhibit
organizational learning, as well as the "secondary loops"
impeding inter-group behavior.

Argyris and Schon also suggest questions that may be
asked to reveal the nature of organizational games which
affect learning. These games, by which individuals aim at
maximizing long-term income while minimizing responsibility
for error, encourage members to whitewash information, thus
inhibiting public appreciation of realities.

Once a map of the existing learning system is completed it can be used to predict the organization's behavior under a variety of circumstances. This allows the map to be tested and revised. As predictions are confirmed, client commitment to the map increases. However, initially, clients are likely to resist the diagnosis offered by the interventionist's map. But those very reactions offer further confirmation of the presence of a certain kind of theory-in-use.

In order for clients to become committed to interpersonal theories of action closer to those of Model II, they need some demonstration that it works, and how to make it work. Here the behavior of the interventionist is critical. By constantly adhering to Model II values in his own interactions with clients, an interventionist offers a living model to his clients. By embracing and working through expression of negative feelings, by constantly seeking clarification and confirmation of views, by discussing the undiscussable, by encouraging risk and discouraging competition and perfectionism, by exposing his own maps and theories to testing—by all these means—the interventionist demonstrates the beneficial possibilities of a Model II theory-in-use.
With mapping completed, and with Model II before them, members of an organization will still need to invent, produce, and generalize a more effective learning system for their organization. This is hard work, but success in the discovery phase will have encouraged members to begin. They will now have a realistic sense of the difficulties of transition, the costs of keeping Model I, and the benefits of Model II.

Since the publication of *Organizational Learning*, Argyris (1982) and Schon (1982) have continued their investigations of learning in organizational settings, using extensive transcriptions, and elaborating on methods for unfreezing the Model I theory-in-use, and encouraging the learning of Model II modes of behavior.

Thus we see that Argyris and Schon, calling on their extensive experience as consultants, offer a clear and detailed set of guidelines for those attempting to serve as interventionists in organizations. I like their practical intent. Any general model of collective learning, if it is to make a difference in the world, will follow their example and include clear guides and tools for those who are collectively attempting to learn collectively about collective learning.
Argyris and Schon insist that organizational learning is an ongoing process in which solution of one problem gives rise to the next. It is in the spirit of "good organizational dialectic," then, that I examine their model of organizations as a contribution to the problem of understanding societal learning at large. My concern motivating this dissertation is to begin working toward a general model of collective learning, toward one that holds for all aid societal transformation in an endangered age. To what extent, then, does the work of Argyris and Schon contribute to that quest? To what extent does their model of organizations hold for other kinds of social systems and offer help for society as a whole?

Offers terms and tools

As a contribution to dialogue about collective learning, their work is invaluable. Although I have chosen to describe at length aspects of their thought, I have hardly done justice to the complexity of thought in their cases and models. Their work gives the most detailed account in the literature of the links between styles of interpersonal behavior and organizational learning. Their
articulation of the ways Model I theories-in-use produce conditions of error, and the way error reinforces such theories-in-use, has given us a "map" by which to know where we are. Their construction of an ideal learning system based on Model II principles helps us to talk about where we might go. Their guidelines for interventionists have addressed issues of how to get there. So extensive is their work that it touches on most of the issues we are likely to confront in working toward a general theory of collective learning. By articulating a view of organizational learning as a change in shared theories-in-use accomplished via the agency of individual members, they add substance to the discussion about the relation of individuals and their groups in collective learning. By defining organizational learning in terms of "error," they clarify the kinds of philosophical choices that must be made in constructing a theory of collective learning. By distinguishing between "double-loop" and "single-loop" learning, they have revealed the intense and central role of norms and goals, and the inevitability of stress and conflict in trying to change them. By describing such conflict they have highlighted the importance of theories-in-use that support members in addressing it. By revealing the inevitability of conflict
in deutero-learning, by admitting the pain such self-examination of habits and norms produces, they have prepared us to endure the process. In short, theirs is a major contribution; they have given us terms for discussion and tools for action.

That does not mean, of course, that I accept their model without reservation. I have already pointed to ways I find their perspective limited. These include the focus on internal environments to the exclusion of others; the pragmatic assumptions which may limit the kinds of learning considered by the theory, and the tendency to view persons and means for organizational ends, in conflict with espoused Model II norms.

Can the model apply to other social systems

My concern here, however, is not with that kind of reservation; rather, it is to ask, "Could their model of organizations serve as a model of collective learning by social systems in general."

In order to answer "yes" to that question, we will need to be convinced that the elements in their model are elements found in all social systems. Are the elements found in families and nation states, volunteer fire departments and armies, schools and scientific societies,
friendships and the human species?

One element can surely be found in all of those—the presence of behavioral worlds. It is almost a necessity that for there to be a social unit there must be a degree of shared understanding by members about how to act. That is, individuals must share similar theories-in-use that pattern their exchanges. Members of a family must share compatible theories about what to do when they are angry; members of a nation must share rules about how to choose its leaders.

By extension, then, it is probably fair to infer that social systems have "theories of action," both "espoused" and "in-use," they share certain assumptions, strategies and goals. While one family may value the expression of feelings, good and bad, another family may suppress them. While one nation may value freedom of speech, another may accept state control of the press. There may be other terms besides "theories-in-use" with which to describe what members of a social system share, and I have already indicated my sense that that term may be to narrow. Nonetheless, I am willing to accept the notion that all social systems share something like a theory-in-use.

All social systems may also be seen to have some form of social structure, however informal. While structure
does not command much of Argyris and Schon's attention in Organizational Learning, we have seen that in Beyond the Stable State Schon felt that some organizational structures were more flexible than others, allowing more rapid allocation of resources to changing tasks, and thus facilitating organizational learning.

Just as all social systems may be seen to have norms, so too may it be important for them to have models of ideal future states, to organize collective transformation. Argyris and Schon's Model II serves this purpose for organizations. Some variant of it may well serve for families and nations.

These, then, are a few of the ways in which Argyris and Schon's description of organizations may hold as a description of other social systems. However, there may be other elements of their model which do not so easily fit as descriptions of other social systems.

One such element is the assumption by Argyris and Schon that organizations have clear and limited sets of goals. That may be so. But as the size and complexity of its goals and the goals of its members. Could you give me a neat list, for example, of the "goals of the United States of America"? Millions of people have been tossing that list around for some time. I am not saying such a
very long list could not be made, nor that a short list like the Bill of Rights would not help; I am only saying that the task would be frustrating, full of confusions, conflicts and abridgements. But the utility of Argyris and Schon's model rests on a workable definition of a social system's norms and goals. In a complex and pluralistic social system, the utility of their model may be limited.

Argyris and Schon's approach may also be limited in a second way as a tool which large social systems can use to foster their learning. Their approach depends on bringing together scattered impressions for consolidation of a shared map of members' collective learning system. They have used this approach with relatively small groups of people in organizations. But we have yet to invent adequate techniques by which to accomplish this for a nation or a species. This is not to say Argyris and Schon's approach is not a useful model; it is. But we have far to go before we can accomplish in large systems what they have in organizations.

In sum, many of the elements in Argyris and Schon's model can be seen as adequate to describe social systems other than organizations. But as the complexity of social systems increases, the utility of a goal-based model may decrease.
Is their model inclusive enough to work? In their introduction to Organizational Learning, Argyris and Schon point out that "unless people acting as agents for organizations and societies are able to learn how to detect and correct double-loop errors, the survival of society may be in doubt" (p. 5). But, with the exception of a few such sentences, society as a level of analysis or action is ignored in Organizational Learning.

This maintenance of a relatively restricted focus is of course sensible. It allows Argyris and Schon to keep their already ambitious project within manageable bounds. Nevertheless, there is a difficulty in such sensible constraints--it may exclude from analysis important parts of the reality which Argyris and Schon wish to explain. The difficulty is that, by Argyris and Schon's own admission, the source of the inhibitions to organizational learning is in society at large. As they say, the inhibition to organizational learning is "reinforced (and, as we shall see, caused) by the theories of action with which most people are acculturated in modern industrial societies" (p. 4). "People in our society are programmed with Model I theories-in-use that predispose them toward single-loop learning rather than double-loop learning"
I agree. Elements of Model I are everywhere—in spelling bees and S.A.T.'s, in Reagonomics and the arms race.

Look again at the governing variables and strategies of Model I as shown in Figure 13 and consider the extent to which they are taught from pre-school to "post-docs."

"Maximizing winning, minimizing losing" is the name of the school game—in class, in sports, in social life. Be rational; minimize expression of negative feelings; define behavioral objectives; control tasks unilaterally. These are all likely to be habits of someone who has had ten or twenty years of schooling in our culture.

But how do Argyris and Schon propose to change such deeply ingrained habits? By a few sessions with an interventionist. Where? In some of the most competitive, high pressure organizations around. It is not surprising that Argyris and Schon report very few cases of lasting double-loop learning and in those, very limited success.

Not that I don't respect the attempt—I do. It's the best yet. I am just afraid that intervention as Argyris and Schon describe it will simply be incapable of bringing about the scope of societal learning demanded by our times. It is unlikely to be sufficiently successful either at the
level of organizations or at the level of society.

The interventions they suggest are likely to be limited in their success with organizations because they do not counter the inertial force of societal pressures acting on members of the target organization. Even if a company, for instance, were to magically change its espoused theory of action, employees would still encounter Model I forces everywhere else they went, making it difficult for them to maintain commitment at work and integrity elsewhere in their lives. But a magical organizational change is unlikely in the first place—it will require the cumulative commitment of the organization's members. But here, we are left with the difficulties individual members face in trying to change the Model I theories of other members of their organization.

I am reminded of a friend with whom I worked at a software consulting firm, a firm that was both high pressure and "hip." One weekend in 1970, my friend attended an "Esalen East" workshop. On Monday he came in esctatic, and urged one and all to bare their deepest feelings. People did not. And when during a recession, my high-priced friend was let go, I wondered if at least part of the reason was not that he made people feel at least slightly uncomfortable with his questions. It may be
revealing to note that since then his efforts have been directed at developing men's support groups outside of organizational settings.

Thus individuals learn that it is dangerous to try to change the behavioral norms of others within existing organizations. I find it unlikely, therefore, to expect much change in the Model I behavior to come from solitary members, nor to come from the society at large which surrounds an organization. The habits of the organization, when reinforced by those of society, will be difficult to change.

We have seen that the interventionists of Argyris and Schon have had only limited success with individual organizations. Therefore it may be unrealistic to expect such interventionists to have a cumulative effect on society at large. Not that Argyris and Schon even discuss such cumulative effects—they offer no comprehensive strategy at all for change at the societal level.

Of course, there may not exist any single switch that can convert all of society at once. We must start somewhere, and Argyris and Schon are doing so, in a domain in which they are knowledgeable. But I am skeptical in part because the very organizations likely to hire high-priced consultants like Argyris and Schon are also
likely to be "successful" ones, saturated with the win-lose, competitive ethos which inhibits the risky business of moving away from Model I. Many are also likely to be ones in which members are employees; thus the already threatening business of questioning existing norms will be doubly threatening, because careers and income may be in jeopardy. Finally, many of those organizations, at least in the United States, will be ones in which the relationships are instrumental, with members treating one another as means rather than ends. Such relationships may be less capable of working through the threats of systemic diagnosis and change than relationships founded on genuine care.

What strategy, then, would I suggest instead? This is not the place for me to discuss in detail how to overcome the kinds of limitations mentioned above. That will have to wait for subsequent discussion of strategies encouraging collective learning. For now though, clues from the work of Argyris and Schon might suggest how to begin.

First, it might make sense to focus on groups that are already more sympathetic to Model II theories-in-use and already suspicious to those of Model I. These would need to be social systems characterized by open and honest dialogue, and by mutual support and care. Such social
systems are probably less likely to be found in the competitive worlds of business, government and academia in which Argyris and Schon have done most of their work. Rather, there may be more chance of their appearance in religious communities or new age groups, knowledge intensive industries, alternative schools, home schools, peace groups, and the like. My hunch is that such social systems are more likely to incubate effective collective learning about collective learning.

A second clue for the design of successful strategy comes from Schon's observation in Beyond the Stable State that public learning tends to be systemic. Changes do not occur isolation. A change in one element of a culture is sure to involve changes in others. In order for one thing to change, others must change. And when one thing does change, so will others. Thus it makes sense to strive for a strategy of collective learning which focuses not on an individual organization, but rather on a social community as a whole. Margaret Mead's study of the Manus suggests that in some ways it may be easier to transform an entire socio-cultural system than it is to change some small part of it (1956). A history of America, from the time of the pilgrims through the experiments of the utopian communities of the last century on through the establishment of the
alternative communities of the last two decades, attests to the awareness that experiments in thorough going social change may be best incubated in autonomous communities committed to a shared vision. Thus we may be more likely to find successful experiments in collective learning about collective learning in communities committed to that effort. In such communities members might then receive support and reinforcement for their efforts to change. They would get such support everywhere—-at home, school, worship, play.

But such systemic efforts by sympathetic communities must not be short-term. They must be sustained if they are to reach the level of regularized change in a community's collective culture. No weekend workshop this. Lifetimes.

With such sustained and systemic efforts by sympathetic groups, there may be some hope of creating lasting living models of what collective learning can be. But if we limit ourselves to the strategies of Argyris and Schon, I see little hope of success. Organizations and their members will not be able to change because they will be overwhelmed by the force of the prevailing Model I culture. And if organizations themselves do not change, then there is little hope that the society as a whole will.

So in the end, Argyris and Schon's theory is not
"pragmatic" because it fails to understand the whole. But it is surely too much to expect one or two individuals to comprehend the whole. Instead we are forced to look for strategies that promote widespread participation from a diversity of perspectives in a sustained dialogue about collective learning. Only with such participation can we hope for a theory grounded in the great range of concrete realities of our diverse experience. And only with such participation can we hope for a social whole harnessing the insight and energy of its members, who are its learners and its workers. Only then is there a chance of arriving at a theory that is adequate, a theory of the whole, a theory that works.

The participants in such a collective endeavor are sure to find themselves time and again using the concepts, terms and tools developed by Chris Argyris and Donald Schon.
If I complain that Argyris and Schon have too narrowly limited their consideration to learning by organizations, I can hardly have the same complaint about Jurgen Habermas, who conceives of the entire "history of the species" as arising from episodes of societal learning.

Jurgen Habermas is not easy to understand. Immersed in a conceptual heritage including that of Kant, Hegel, Marx, Adorno, and Piaget, and developing his own concepts and distinctions over the last three decades, his writing in a given article is only comprehensible in relation to the rest. He writes at a high level of abstraction which, one senses, can only be fully known in his own German noun-building. My attempt to abstract a paraphrase here does not do justice to the original. I offer it in the spirit in which American tourists bring back sketches of the Alps.

Habermas's Model of Societal Learning and the Historical Process

Let me, then, offer a postcard synopsis of some key
features of Habermas's model as I infer it from his various writings. While these differ in phrasing and detail, their overall thrust is consistent with the provisional flow-chart I have abstracted in figure 21.

Figure 21. Social evolution per Habermas
Technical knowledge and normative knowledge

To understand the model requires understanding a distinction Habermas draws between two dimensions in which the species learns: 1) "technically useful knowledge decisive for the development of productive forces" and 2) "moral-practical consciousness decisive for structures of interaction" (1979, p. 148).

These two dimensions correspond to the two aspects of what Marx called the "mode of production" (1979, p. 138). On the one hand a given mode of production is characterized by a certain stage of development of the "forces of production," that is, the labor power, the technical knowledge, and the organizing knowledge which coordinate labor. On the other hand, a mode of production is characterized by a stage of development of "relations of production," that is, social institutions determining how labor is combined with the means of production, who controls production, how wealth is distributed and how interests are satisfied.

Habermas sees the former dimension—the forces of production—as regulated by "rules of instrumental action," which direct the transformation of material, and by "rules of strategic action" which coordinate cooperation in production (1979, pp. 131-132, p. 145).

The second dimension—the relations of production—is affected by "rules of communicative action" which structure the distribution of products, control, and
interests. The rules of communicative action are linguistic, intersubjective, supra-individual understandings by which interactions are mediated (1979, p. 118). They prescribe the reciprocal expectations of members of society about interactions and consequences, about roles, norms, and principles justifying these norms (1979, p. 82). At the core of these rules are law and morality, which provide consensual regulation of conflict without force (1979, p. 99).

**Historical materialism and societal learning**

The distinction between the two dimensions—technical and normative—is important because it is the basis on which Habermas "reconstructs" historical materialism. Marxists have traditionally focused on the economic base as the sole source of development in history, viewing law, politics, and social consciousness as mere "superstructure." One of Marx's statements most often cited in support of this view is the following:

The mode of production of material life conditions the general process of social, political, and intellectual life. It is not the consciousness of men that determines their existence, but their social existence that determines their consciousness. (1970, pp. 20-21)

Habermas argues that the context indicates that Marx did not intend the distinction to be applied in all circumstances but "only for the critical phase in which
a society passes into a new developmental level" (1979, p. 143). In such a crisis, Marx sees the following occurring:

... the material productive forces of society come into conflict with the existing relations of production. From forms of development of the productive forces, these relations form into their fetters. Then begins an era of social revolution. The changes in the economic foundation lead sooner or later to the transformation of the whole immense superstructure. (1970, p. 21)

By this account one could view the process as endogenous learning in which individuals develop new cognitive-technical capabilities which are put to use, developing the forces of production to a stage at which the relations of production are no longer adequate. In this sense, the societal learning in the technical domain could be seen as a "trigger" to the development of new levels of societal integration.

Is technical learning the "trigger"?

Habermas claims that the historical record offers important cases—among them the rise of European capitalism—in which the development of productive forces followed, rather than "triggered," development of advances in social integration. Habermas tries to clarify the situation with a distinction between the development of a store of potentially usable technical knowledge and its actual use. Thus Habermas says, "This potential knowledge, however
can be implemented to develop the forces of production only when the evolutionary step to a new institutional framework and a new form of social integration has been taken" (1979, p. 147).

Unfortunately, on the prior page, Habermas himself cited cases (in Polynesia and South Africa) "in which system problems arose as a result of an increase in productive forces, overloading the adaptive capacity of societies organized on kinship lines and shattering the primitive communal order."

Thus, Habermas leaves the reader confused about whether technical learning is or is not a trigger to social evolution, and if so, when. The confusion is compounded by the fact that Habermas sometimes talks of systems problems arising from the development of productive forces, and sometimes, as the result of ecological factors such as population growth (for example, p. 162). (For that reason the sources of system problems have been drawn with dotted lines in figure 21.)

**Normative learning follows its own developmental logic**

Whatever Habermas's views on the role of technical learning as a trigger of social evolution, his main objection to the Marxist historical explanation is that it fails to recognize the pivotal role of normative learning
as the "pacemaker" of social evolution. For, though Marx's description may account for the development of disequilibrium between forces of production and relations of production, it fails to account for the restoration of equilibrium, at a new level of social integration. For that to happen, the relations of production must be altered, and that demands a non-technical kind of knowledge, a moral mode of thinking that gives rise to new structures of interaction preferable to the old. Thus, in Habermas's view, the replacement of the overburdened kinship system by the state required the achievement of a level of moral understanding less tied to the power of persons and more dedicated to general principles. But without such developments in the collective moral-practical understanding, the social system would be unable to overcome its tensions caused by disequilibria between the forces of production and the relations of production. The social system would be stuck. But with an advance in the system's structures of interactions, the social system is suddenly able to unleash stored-up technical knowledge, improving the forces of production. "Thus for social evolution, learning processes in the domain of moral-practical consciousness function as pacemakers" (1979, p. 160).

If that sounds like heresy to historical materialists, they may be even more discomfitted to hear Habermas say that moral understandings and their rules of communicative
communicative action "do develop in reaction to changes in the domain of instrumental and strategic action; but in so doing they follow their own logic" (italics his).

"These developmental logics betoken the independence--and to this extent the internal history--of the spirit" (1979, p. 123). Is this an echo of Hegel's "spirit coming to know itself"? Not quite, for Habermas's analysis is "materialist" by making reference to system crises in the mode of production, and "historical" by seeking causes of evolutionary changes in the whole range of contingent circumstances. Habermas does claim that normative structures display their own developmental logic from stage to stage. However:

This logic says nothing about the mechanisms of development; it says something only about the range of variations within which cultural values, moral representations, norms and the like--at a given level of social organization--can be changed and can find different historical expression. In its developmental dynamics, the change of normative structures remains dependent on evolutionary challenges posed by unresolved, economically conditioned system problems and on learning processes that are a response to them. In other words, culture remains a superstructural phenomenon, even if it does seem to play a more prominent role in the transition to new developmental levels than many Marxists have heretofore supposed. This prominence explains the contribution that communication theory can, in my view, make to a renewed historical materialism. (1979, p. 98)

Individual and societal learning are interdependent

Before we examine the logic of development, the
"internal history" of normative learning, we should review Habermas's statements about how it is that societies can "learn" and in what sense they do so:

Individually acquired learning abilities and information must be latently available in world views before they can be used in a socially significant way, that is, before they can be transposed into societal learning processes.

Since the cognitive development of the individual takes place under social boundary conditions, there is a circular process between societal and individual learning. . . . The rationality structures embodied in the family have first to be absorbed by the child in the development of his interactive competence. . . . But the state of societies could itself only be changed by constructive learning on the part of socialized individuals. It is only in a derivative sense that societies 'learn.' (1979, p. 121)

Or, in another phrasing:

It is the personality system that is the bearer of the ontogenetic learning process; and, in a certain way, only social subjects can learn. But social systems, by drawing on the learning capacities of social subjects, can form new structures in order to solve steering problems that threaten their continued existence. To this extent the evolutionary learning process of societies is dependent on the competencies of the individuals that belong to them. The latter in turn acquire their competencies not as isolated monads but by growing into the symbolic structures of their life-worlds. (1979, p. 154)

Societal homologues to individual moral development

Since Habermas sees social evolution as requiring learning by both society and individuals, his research strategy is to examine some existing theoretical models of individual cognitive development for clues towards a model of learning at the societal level. His suggestion is that
there are homologues between the structures of consciousness developing during the history of the species.

Thus, drawing on the work of Piaget, Freud, and Jane Loevinger, among others, Habermas presents evidence for the existence of stages in the development of the ego -- for example, 1) symbiotic, 2) egocentric, 3) sociocentric-objectivistic, 4) universalistic. He then goes on to suggest that similar stages may be discerned in the evolution of worldviews seen in societies' myths, religions, philosophies, and cosmologies. Similarly, Habermas draws on the work of George Herbert Mead and others to suggest that homologues exist between the structures of ego identity and group identity. But it is in the domain of moral consciousness that Habermas has furthest pursued the suggestion that homologues exist, and it is those we will consider here.

The focus on moral consciousness is appropriate given its importance for the reconstruction of historical materialism. Returning to figure 21, we will remember that societal learning occurs both in the cognitive-technical areas bearing on the mode of production, and in the moral-practical, bearing on the maintenance of inter-subjective understanding on which social interaction and integration depend. The dynamics of production are well worked out by historical materialists, and Habermas has not pursued cognitive homologues in that domain. But reconstruction
is needed in the interactive domain, and it is here that Habermas has focused his work. And while the evolution of worldviews and the structure of collective identity contribute to this, it is "law and morality [which] mark the core domain of interaction," for they provide the consensual, non-violent regulation of action conflicts which allows other forms of communicative action to continue.

And, of course, Habermas had available to him an already worked out model of moral development at the individual level—namely that of Lawrence Kohlberg. A summary of Kohlberg's stages of moral reasoning, as reported by Turiel in 1974 is given in figure 22.

Habermas describes the three major divisions of Kohlberg's model as follows:

At the preconventional stage, at which actions, motives, and acting subjects are still perceived on a single plane of reality, only the consequences are evaluated in cases of conflict. At the conventional stage, motives can be assessed independently of concrete action consequences; conformity with a certain social role or with an existing system of norms is the standard. At the postconventional stage, these systems of norms lose their quasi-natural validity; they require justification from universalistic points of view. (1979, p. 156)

Habermas then uses Kohlberg's classifications to distinguish a number of levels of social integration according to the stage of moral reasoning evident in the following three societal structures: 1) those structures of general, normal, non-conflictual, everyday action, as in family relations;
Figure 22. Kohlberg's stages of moral reasoning.
2) the structures of conflict resolution, morality and law given hortative expression in worldviews, myths, etc.;
3) the structures of institutionalized law and binding morality. For a given society the stage of moral reasoning seen in each of the three structures may be at variance. Habermas's tentative sketch of these configurations is given in figure 23.

**Societal Structures**

<table>
<thead>
<tr>
<th>Level of Social Integration</th>
<th>Normal Action</th>
<th>Worldview</th>
<th>Law</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neolithic societies</td>
<td>C</td>
<td>Pre + C</td>
<td>Pre</td>
</tr>
<tr>
<td>Early civilizations</td>
<td>C</td>
<td>C</td>
<td>C</td>
</tr>
<tr>
<td>Developed civilizations</td>
<td>C</td>
<td>Post</td>
<td>C</td>
</tr>
<tr>
<td>Modern age</td>
<td>Post</td>
<td>Post</td>
<td>Post</td>
</tr>
</tbody>
</table>

Key: "Pre" = preconventional; "C" = conventional; "Post" = postconventional

Figure 23. Habermas's stages of moral development in societal structures.

Habermas admits that his scheme is tentative, and gives little evidence for corroboration. But the following example which he offers may give a sense of the pattern by which societies institutionalize moral structures homologous to those observed in individual moral development. By his account, in neolithic societies the normal (i.e. relatively non-conflictual) actions were regulated by con-
ventional kindship norms, and motives were assessed independently of consequences. But the neolithic legal system was preconventional, relying on feuding law that assessed only consequences. But the neolithic legal system was preconventional, relying on feuding law that assessed only consequences, compensated damages, and restored the status quo ante. Conflicts were sometimes settled by temporary couts of arbitration whose "law" was merely that to which parties could agree. The consciousness embedded in worldviews, on the other hand, had elements of the conventional stage of moral consciousness. Thus, many myths tell stories of conflict resolved by "conventional" criteria.

As suggested in figure 23 above, that consciousness became institutionalized in law with the development of early civilizations. While neolithic societies sometimes institutionalized special roles for special needs (for example, temporary chiefs for wartime), such roles were not permanently linked to the system of justice. But as conflict over land overloaded neolithic capacities to handle conflict, the role of a ruler who adjudicated conflict became permanent. But his legitimacy came from deciding on cases according to a structure of moral consciousness widely expressed in worldviews. No longer were conflicts resolved merely by what parties could agree to according to their concrete distribution of power, but according to social norms grounded in tradition. These
norms embodied principles characteristic of a conventional stage of morality, including the evaluation of actions according to intentions as well as consequences, the ascription of liability to individuals, and the administration of punishment rather than retaliation.

A seventh stage of individual moral development

Beyond the stages sketched in figures 22 and 23, Habermas also gives hints about the possible character of normative structures of the next emerging society. But to understand that, we must first understand a seventh stage of individual moral development which Habermas adds to Kohlberg's original six, and which serves as the base for the next societal homologue. Stage 7 is summarized at the bottom of Habermas's scheme in figure 24.

Kohlberg's highest stage, Stage 6, (in the 1974 formulation) has at its center the individual conscience operating under self-chosen abstract universal principles. An example of such a principle is Kant's categorical imperative: "Act only according to that maxim by which you can at the same time will that it should become a universal law." In Kohlberg's sixth stage, the conscience seems to be operating under something akin to Kant's "pure practical reason" which makes its ethical choices independent of a person's inclinations, needs, or interests.

However, it is precisely such interests which are
### Figure 24. A seventh stage of moral development per Habermas.

<table>
<thead>
<tr>
<th>Role Competence</th>
<th>Stages of Moral Consciousness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age level</td>
<td>Level of Communication</td>
</tr>
<tr>
<td>I</td>
<td>Actions and consequences of action</td>
</tr>
<tr>
<td>II</td>
<td>Roles</td>
</tr>
<tr>
<td>III</td>
<td>Principles</td>
</tr>
<tr>
<td></td>
<td>Universalized duties</td>
</tr>
</tbody>
</table>

Source: Habermas, 1979, p. 89
the concern of ethical choice. Thus Habermas's approach, rather than washing moral reasoning of the taint of needs, maintains them as an integral part of deliberation. The difficulty in the Kantian approach is that the search for the universal is made dependent on the individual, who is expected, on his own, to suppress all his individual inclinations as factors in his reasoning.

Habermas's approach, on the other hand, admits the presence of individual interests, but seeks to overcome them through a communal dialogue. The goal of such dialogue would be to reach a consensus about which interests are generalizable and which are not. This requires reflexive discourse in which individuals continually submit their principles of justification to testing by others. Thus individual conscience and interpretation of need become objects of discourse. But participants of such discourse should as far as possible make their judgments in a way that is free from the distortions of internal or external constraints. And they should seek an agreement with whose validity any and all such participants would agree. Of course, such participation does not exist, but it serves as the ideal for a "universal ethics of speech." Thus Habermas's seventh stage differs from Kohlberg's sixth in that "the principle of justification of norms is no longer the monologically individually applied principle of generalizability but the communally followed procedure
of redeeming normative validity discursively."

The next stage of social integration

What then would be a future societal homologue to this seventh stage of moral development? Habermas offers only hints. It would replace the moral freedom of the autonomous individual of stage 6 with freedom that is political as well as moral. A world society of unconstrained individuals would have participation as a central principle. And "the 'pursuit of happiness' might one day mean something different—for example, not accumulating material objects of which one disposes privately, but bringing about social relations in which mutuality predominates and satisfaction does not mean the triumph of one over the repressed needs of the other" (quoted by McCarthy 1979, p. xxiv).

However, Habermas reminds us that every stage of societal learning, while institutionalizing a solution to one problem, dialectically gives rise to consciousness of another. Thus, Habermas speculates that while a post-modern society may solve current problems (such as distribution of scarce material goods), it may engender a new problem centered on the supply of motivation and meaning.

Criteria of progress

According to Habermas, the dialectic of history is not haphazard, and reveals a principle of progress. Any
theory of social evolution implies direction and criteria for progress. But Habermas rejects older criteria such as "survival," and "complexity" as arbitrary and inadequate. Instead, he rests his sense of progress on the intrinsic nature of the communicative action that is at the center of his philosophical system. For communicative action, if it is to lead to consensus, must be founded on certain presuppositions: "the presupposition, for instance, that true propositions are preferable to false ones, and that right (i.e. justifiable) norms are preferable to wrong ones" (1979, p. 177). These presuppositions are not a matter of choice, they are unavoidable. They are prerequisite to meaningful discourse. Therefore, Habermas concludes:

I do not regard the choice of the historical-materialist criterion of progress as arbitrary. The development of productive forces in conjunction with the maturity of the forms of social integration, means progress of learning ability in both dimensions: progress in objectivating knowledge and in moral practical insight. (1979, p. 177)

Evaluation of Habermas's Model for Collective Learning about Collective Learning

Our concern in this chapter is to gain an understanding of some existing models of collective learning which offer major contributions toward the "001 task" of collective learning about collective learning. Of those major models, that of Habermas is the one with the broadest and deepest
theoretical penetration. The paraphrase of his philosophy I have given does not do justice to the scholarship and originality he applies to a range of fundamental philosophical issues. His theory of the history of the species builds on intimate knowledge of historical materialism; his theory of societal learning proceeds from novel, carefully worked out philosophies of knowledge and communicative ethics. His consideration of issues of development draws on a great range of scholarship from diverse disciplines. As such, his model goes far towards a paradigm which bridges a variety of perspectives. Of the available models, his is philosophically the most complete and coherent.

Habermas's breadth does not detract from his immediate value for our historical moment. In an age when technical learning has given us devastating nuclear arsenals but when normative learning has yet to offer institutionalized modes of resolving international conflict, other people need to follow Habermas in elucidating the process by which such institutionalization may occur.

Here, an understanding of the link between individual learning and societal learning may prove critical. Society will not be able to institutionalize systems for resolving international conflict without substantial learning by individuals. But individual learning by itself will not be sufficient; it must be alloyed into something different in kind—societal learning that addresses our common problems.
For reasons like this, I consider the central value of Habermas's work to be his attempt to construct a model that links the "history of the species" to individual cognitive development. Neither is adequately explained, it seems to me, without an account of the other. A theory of societal learning must include a theory of individual learning, and vice versa, since each is dependent on the other.

**Habermas's Model Depends on the Validity of the Individual Homologues**

Habermas's model is not without problems. Principle among them is his reliance on homologues for the elaboration of his theory. First, a homology depends on the validity of the description in the root homologue. If the descriptions of individual learning are inadequate, they cannot be the basis for an adequate account of societal learning. But the models of individual development which Habermas uses are themselves open to some question.

Many questions cluster around the issue of whether or not the models are in any way culture-bound. For instance, one of Kohlberg's proteges, Carol Gilligan (1981), has suggested that her mentor's model of moral development has a masculine bias, and that it does not accurately describe the development of moral reasoning in women. For example, she sees the Platonic path to universal principle as less important to many women than the development of
their ability to care creatively for parties in a conflict. Thus, a model of the development of society's normative structures would be substantially different if based on the homologue of Gilligan's model than if based on Kohlberg's.

Another example of variation in source models is the suggestion by Seymour Pappert that computers may immerse children in a "culture" so different from any prior human culture that the Piagetian model of cognitive development may have to be revised. Specifically, he sees the importance of "procedural" thinking--the creation, nesting and repeating, revising, and blending of procedures--as so central to computers that, when kids begin working with them, their cognitive development may take paths unanticipated in Piaget's model. A revision in that model would, once again, require a shift in the societal homologue.

Of course, considerable study has been devoted to the cultural universality of the Piagetian and Kohlbergian models, and Habermas would quickly admit that scientific models are necessarily captive of their historical settings. But to the extent that there exists dispute about models of individual learning, a model of societal learning constructed by homology is also open to dispute.

Similarly, a theory of societal learning based on homologies is limited by the choice of homologues. Thus
Habermas has chosen, rightly I think, to focus on models of moral development. But he has ignored work by Fowler (1975) and others which offer models of spiritual development. As this is different, and as the models differ, so too would models of societal learning constructed on such models.

Is the use of homology valid?

A second, more fundamental issue is not so much whether the root homologues are well chosen and valid, but whether the very use of homology is a valid basis for the construction of social theory. This is an issue to which Habermas himself is sensitive. He warns against over-hasty parallels between societal and individual development, and enumerates a list of provisos about the use of such homologues. These include consideration of the many ways in which societies differ from individuals, altering the nature of the homologous structure of consciousness.

Nonetheless, he feels genuine homologues can be found, and makes the search for them central to his research strategy. As a strategy, it is a useful stimulus to thought. The history of science is full of examples of the beneficial uses of analogy and metaphor. But the lasting value of the metaphor is not just in the initiation of thought, but in the degree to which the inner structure of the metaphor gives a coherent and compelling account of
the phenomena. And here the jury on Habermas's homologies is still out.

For my part, I find the descriptions of the homologies given so far as sketchy and unconvincing. Habermas works from a European theoretical tradition quite different from that of American empiricism, and develops his thought from logical imperatives rather than empirical ones. But I would like a more thorough examination of the degree to which his theoretical structure is confined in the historical and anthropological record. When biologists construct theory by referring to homologies between a human arm and a bird's wing, they are using clear and carefully observed comparisons. Homologies between individual and societal learning need to be similarly grounded in careful observation.

The biologists' use of homology is also more restricted than Habermas's in another way: theirs does not leap from the level of individual to group phenomena. When biologists compare the bone structures of a human and a bird, they are comparing individual creatures, presumably genetically linked to common individual ancestors. But when Habermas compares the structures of consciousness in individual humans and societies, he is comparing two different levels of organization whose "genetic" links are obscure.

My reservation about such cross-level comparisons is
that, while societal structures may arise from individual structures of consciousness, that does not mean that they will replicate individual structures in a mirror-like fashion. Though a molecule is made of atoms, its structure is not a mere repetition of atomic structure "writ large"; new organizing principles come into play. Nor is Henry Moore's sculpture "The Family" reducible to its molecules. And modern culture is hardly reducible to the individual psychology of Henry Moore and others. In a similar way, although societal learning is obviously constituted of individual learning, thinking of it as only a mirror-like homologue may miss something. New organizing principles may be required to understand the leap from individual learning to societal learning. While I cannot yet state what those organizing principles may be, I am cautious about treating societal learning as a merely magnified image of individual learning.

Habermas is cautious about a similar cross-level comparison—that made between biological and cultural evolution. Among his reservations is the fact that while the mechanisms of genetic imitation are now well analyzed, the same cannot be said of the mechanisms involved in cultural tradition and learning. As he says:

As long as these mechanisms are not adequately analyzed, however, we cannot judge whether the comparison between imitation and tradition is merely metaphorical or whether the underlying social learning mechanism is
in some way functionally equivalent to the process of mutation. One difference should arouse our suspicion; whereas the mutation process produces chance variations, the ontogenesis of structures of consciousness is a highly selective and directional process. (1979, p. 172)

**In what sense is societal learning homologous to individual learning?**

Habermas does not seem to take his homologies between individual and societal learning as merely heuristic tools, but as something reflecting actual processes. But his exposition of the nature of the processes and homologues is not always clear.

Perhaps some confusion might be reduced if we distinguish here between two ways of viewing society as "learning." One way is to think of society as a learning entity, just as an individual is a learning entity. The second way is to think of society as part of an integrated process in which society is both a result of individuals' learning and a cause of it. To think of societal learning in the former sense would mean that a homologue between individual and societal learning envisioned the societal entity as mirroring the same stages, structures and dynamics of learning as individual entities display in their learning.

But Habermas usually does not seem to be thinking in these terms, at least on careful examination. Rather, he seems to be thinking of societal learning in the second sense. He talks of individually achieved structures of consciousness. In this sense, a homologue is not so much
a case of entities having similar structures, but ones embodying similar principles of consciousness. Thus, when Habermas classifies early state civilizations’ legal order as "conventional," he does not seem to be describing a learning entity (the state) which behaves toward other states according to "conventional" modes; rather, he seems to be saying that legal system's method of thinking about resolution of conflict (internal to the society itself) had characteristics of the conventional model of moral reasoning.

However, we can then ask who it is who is reasoning conventionally. Although Habermas does not ask that question, I am sure he would agree that it is individuals—for example, the rulers, judges, and the majority of the members of society giving assent to the legal system. So in what sense can "societal" learning be said to have occurred? Perhaps in this sense—that those members of society who rule or prevail have made conventional moral reasoning the collective rules of the game. But this is a less forceful homologue than it first seems, and certainly different from the first sense mentioned above.

At the center of these difficulties is a need for a clear definition of "who" it is that is learning in "societal learning," and in what sense. These slippery issues are ones we will pursue in the next chapter.
Research questions

Let us accept the interpretation that Habermas means societal learning to be some sort of societal institutionalization of more mature modes of individual reasoning. What, then, can be said of the status of his "research agenda" and its import for collective learning about collective learning? What questions remain to be answered?

First, much more needs to be learned about the psychosociological process by which advances in individual cognitive structures become the structures which are followed by the members of society in dealing with their collective problems. Is this a matter of the percentage of members achieving a level of cognitive development, or a matter of the level achieved by key decision makers? Can the distribution of such individual achievements be measured, or only guessed at in this historical record?

To the extent that historical patterns of individual development can be measured, do such measures support Habermas's assumption that there exist discreet stages of societal learning, following an invariant pattern. Not only do we need to know more about how individual learning affects society, we also need to know more about how societal structures constrain and motivate individuals' learning. Such questions raised by Habermas's model call out for research, which builds and integrates the knowledge established by the separate disciplines in the social
Beware of bifurcations

If the individual learner turns out to be pivotal after all, even in the hidden core of Habermas's scheme, that warns against the neat separation Habermas makes between the technical and normative domains of societal learning. I, as an individual learner, do not make such a neat division. I live in a world in which technologies, worldviews, and legal structures all are impinging on my consciousness simultaneously and continuously. It is difficult for me to divide my reasoning about nuclear power into purely technical or purely normative domains. Nor is it easy to identify when a multiplicity of technical and economic factors triggered normative thinking, and when normative insights suggested technical directions. My mental life is an ecology of mutually interacting influences. It seems better understood as an orchestra rehearsing toward a symphony than as a series of solo voices.

It should not be surprising, then, that many careful historical examinations portray technical and normative factors as affecting each other in parallel, rather than in sequence. Thus, Robert Merton's lucid study, Science, Technology, and Society in Seventeenth Century England, describes the interacting effects of puritan values,
technological developments (in mining, transportation, and the military), social developments (as in postal systems, the Royal Society), external forces (such as military threats), and economic forces (for example, profits from maritime trade). Merton concludes his study with a caution against one factor social theory.

The continual interpenetration of forces in social history merely reflects the fact that societal learning operates through individual learners whose nature is to be continually integrating disparate cognitions. This suggests, in other words, caution about Habermas's bifurcation of technical and normative learning. And it suggests that the issue of which factors are "triggers," "base" or "superstructure," an issue inconsistently handled by Habermas, and long plaguing Hegelians, Marxists, and Weberians, is an issue arising from an artificial bifurcation.

But if we shift to wholistic or ecological models of societal learning, with wholistic individual thinkers as operators, then perhaps we might be better able to model the observed dynamics.

Habermas's contribution is to link an account of the history of the species to the logic of development of structures of individual consciousness. What one senses is now needed is a theory that better integrates theories of individual learning and theories of societal learning; that includes societal learning as a factor in individual
learning and vice versa; and that unifies them under a single scheme.

Such an integration is a long way off. As a step in that direction, in the next chapter I will adopt a view of individual learning as largely influenced by collective factors, and a view of collective learning as arising from the learning of social individuals in social intercourse with each other.
CHAPTER VI
TOWARD A GENERAL MODEL OF COLLECTIVE LEARNING: CLARIFICATION OF ISSUES AND TERMS

In Chapter I, I pointed to the growing number of efforts to model social processes as processes of collective learning. I argued that such modelling could aid understanding of social systems by clarifying assumptions, terms, concerns, and issues, and by revealing new dilemmas in turn.

This iterative, question-answer-question process was evident in our review of models in Chapters II to V. In Karl Deutsch's seminal work, we found concepts and terms useful to those who followed. Among these were the delineation of functions that must be performed for a system to process information, pathologies which result from those functions not being met, and distinctions among kinds of learning according to what is changed in the process. However, we also saw that this cybernetic model, born of electronics, gave little attention to the role of human learners in human social learning. March and Olsen's model, however, makes no such omission; they conceive of organizational adaptation as a direct outgrowth of what individuals perceive to be the effects of organizational
action on its environment. With this view they are able to identify limits to experiential learning brought on when the links are weakened between individual beliefs, individual actions, organizational actions, and environmental responses. But the simplicity of their model helps to reveal factors which they have left out, such as the shift in a member's beliefs engendered by his organization's actions. Such learning about the internal organizational environment is addressed in detail by Argyris and Schon. In perhaps the most thoroughly worked out model to date, they describe the manifold ways in which the "behavioral worlds" and "theories-in-use" affect what an organization learns and how well. In particular they demonstrate how the prevailing "Model I Theory-in-use" with its win-lose, protect yourself attitudes, inhibits open organizational inquiry into threatening issues. Argyris and Schon develop methods of intervention to help members of organizations move from Model I to Model II. But, such intervention faces a difficult task, because the Model I behaviors are a pervasive part of our culture and not easily changed with interventions in a single organization. That is, Argyris and Schon's model, complete as it is, is not complete enough; it does not account for the force of societal factors. And while such larger societal forces do receive attention in the work of Jürgen Habermas, his model lacks any detailed description of the process by which
individual learnings actually get impounded in homologous social forms.

We Now Need a More General Model

Each of the above models makes its own contribution and reveals its own shortcomings. This is to be expected because each arises from the concerns of its disciplines and does not intend to go beyond them. But while this is prudent scholarship, it creates a dilemma. A complete account of the learning in any given social system is likely to require an account of the learning of social systems other than itself.

No social system is entirely autonomous; it is affected by the learning and actions of other systems. For example, the learning by a business organization is likely to be affected by the learning by departments, competitors, governments, and by society at large. A government's learning is likely to be affected by that of business organizations, and by society at large. A society's learning is a function of learning by component parts, and is affected by other societies with which it comes into contact.

The range and complexity of these mutual influences is not adequately represented in any existing models. Each, by focusing on the subject of its own discipline, largely
ignores the full range of influences. Argyris and Schon, for example, shed light on interpersonal dynamics within organizations, but do not attempt to examine the societal sources of those dynamics. By their own description, Model I interpersonal behaviors are part of almost everyone's socialization and are at the core of industrialized society and culture. And though they say there can be no organizational change to Model II behaviors without social and cultural change, they do not offer a theory of social change. Instead, they stick to their disciplinary strength—the examination of interpersonal relations in organizations. Thus their strategy for intervention and change is primarily focused on learning by individuals and relatively small groups, and not on larger societal processes as well. Of course, Argyris and Schon are aware of this dilemma. What I am suggesting here is that one way out of the dilemma may be to search for a more inclusive, integrated theory, one which may suggest more wholistic and effective strategies for action.

In a similar way, Deutsch's model of decision by central governmental organs lacks an account of the immense sea of social intercourse on which political decision floats. And Habermas's grand theory of social evolution lacks an account of the dynamics by which the cognitive development of individuals becomes embedded in society's institutions.
Each model is incomplete. Each, by focusing on only one level of collective learning to the exclusion of others, fails to do justice to the full range of factors affecting the level in question. By focusing on one part, each model not only fails to understand the whole, it also fails to understand fully the part which it examines.

This was appropriate for the period of trailblazing during which these models were made. And I am sure each author is aware of these difficulties. But I sense the time is now nearing when a more integrated model might be possible. The fact that scores of recent studies (cited in Chapter I) from a diversity of disciplines have all examined a social system as a "learning" system, suggests there may be an implicit common perspective permitting their integration.

If this is a time when the developments in separate disciplines prepare the way for a cross-disciplinary integration, it is also a time that calls out for such integration for practical reasons. This is an age of interdependence. Most social systems are part of a vast, often global network of other social systems. Most depend on each other for sustenance, security and satisfaction. The problems any one system faces are often enmeshed in a tangle of related problems in other systems. Learning is more and more a multisystem matter. So it would help in addressing the problems of our time, if we were able to
fashion an integrated model accounting for the interactions of the collective learnings of the parts and the whole.

One approach to integration might be simply to patch together existing models of the various levels of social systems. But, the result would be like a lizard's body with an elephant's head and the legs of a daddy longlegs—neither pretty to look at nor likely to live.

A more pleasing approach would be to search for a universal pattern. It is worth asking if there is a common pattern in the learning of social systems of all kinds and sizes—families and Freeze movements, businesses and nations. But, as noted above the pattern would need to account for the effects of the learning of social systems on each other. It would need to be able to be applied simultaneously to the learning of a focal social system, its subsystems, its peer systems, and the suprasystems of which it is a part.

This second approach, however, demands that a host of issues be addressed. The first is whether such a model is possible in principle, whether all social systems share enough learning-imbued features to provide common ground for a general model. Another is to specify in what sense the term collective learning is being used, and why such usage is valid. Further, any general model will need to specify the process by which collective learning proceeds, with acknowledgment of the impact of other social systems'
learning. Are there varieties of collective learning? Can a typology be advanced to describe the variety of collective learning styles? These are some of the questions a general model must address. My approach in this chapter will be to address them in turn by suggesting my own preliminary responses to them, in the hope that such a preliminary model may aid the process of further modeling.

**Identifying Common Learning-related Features Shared by All Social Systems**

The first issue any attempt to form a general model of collective learning must face is whether there are enough commonalities across all social systems to provide a basis for comparison. And a general model must not only demonstrate that these commonalities exist; it should also be as explicit as possible about its assumptions about the nature of those commonalities, for they will set the parameters--the terms, questions, premises, views, and limits--within which the modelling will proceed. In the section which follows I will suggest a tentative list of commonalities and assumptions about them. Other investigators could offer a different list. But the strength of any eventual model will vary with the extent that its basic assumptions about common elements are clear and well founded.
For my purpose here I need not be overly precise in defining what I mean by a "social system." I have in mind a group of humans, interacting to accomplish functions, following some pattern of communication and interaction. These groups are "systems" in the sense that the actions of one member affect other members, in a network whose whole is not comprehensible only in terms of the parts. However, I am not subscribing to a purely "general systems" view of social groupings, with its tendency to overdraw the sharpness of boundaries between systems, to stress self-maintenance at the expense of self-transformation, and to understate the complexity of a system's goals. And I emphatically wish to avoid the tendency among many general systems theorists to talk at such a level of abstraction that they forget that social systems are peopled with real, living, unique, quirky individuals whose minds and personalities are a source of surprise, innovation, and learning.

Just as persons are unique, so too are social systems. No two families are exactly the same, nor any two businesses. Each has its own history and character.

Further, following the definition above, social systems may include groupings that vary greatly in size and complexity. They may be as small as a couple and as large as the human species. They may be relatively simple in purpose and pattern (as in the case of thirty thousand
people at a baseball game) or relatively complex (as in the interactions of people in a thirty thousand person company). There is any number of ways to classify this diversity; for purposes of discussion, I will suggest classifying social systems into the following ten levels: dyads, as in friendships or marriages; small groups, as in discussion groups; crowds, as in a theater; informal organizations, as in neighborhood groups; formal organizations, as in businesses or universities; movements, as in the "Freeze"; poleis, as in the Greek city state or the New England town meetings; governments, local, state, and national; international organizations, as in the United Nations; socio-cultural systems, as in that of the Tasaday or modern industrial society; and homo sapiens.

The immense diversity of size, complexity, purpose, history, and character of social systems should make us question whether any meaningful general model is possible, even in principle. There is the danger of confusing apples and oranges, and baking orange pies.

But a biologist can safely compare apples and oranges as fruit, and fruit and humans as living things. Similarly, it is at least conceivable that social systems as different as a bridge club and a nation might share some salient common features.

Without such salient common features, however, a model of social systems in general will not be possible. Further
for our purposes, those features must be integrally related to learning; they must be important to the process of "collective learning." Finally, the features must be genuinely held in common, with similar meanings for the different social systems.

Such common features can be found in the models we have already reviewed, although those models were not intended as general models. Although Deutsch was describing governments, all social systems may be seen to process information, make decisions, and dissociate and recombine resources. All social systems may be seen to share March and Olsen's description of organizations as systems linking individual beliefs, individual actions, systemic actions, and environmental response. Surely all social systems have "behavioral worlds" and something like "theories-in-use" as described by Argyris and Schon. And all social systems are faced with occasions on which outcomes do not match expectations, and all go through some process for either hiding the error or bringing forth ideas about how to correct it. Finally, although Habermas was describing society at large, social systems of all sizes share some of the features he describes. Among these are the presence of technological and normative systems, and members capable of cognitive development, communication, and discourse.

These features above are enough to suggest that sufficient common ground exists to form the basis for a
general model of collective learning systems. Further, common features are to be found in other models not reviewed here, and from other disciplines. However, each feature is expressed in the terms of its source discipline; their combination would be a hodge-podge. Therefore, I will suggest below five common features phrased in simple terms not encumbered with special usages by different disciplines.

Any features held in common by all social systems are sure to be so commonplace as almost to escape notice. In fact, one of the benefits of this exercise may be to restate things that are so obvious they are often ignored. But while the presence of the commonalities below should be obvious, it may be less obvious that they are all the products of prior learning and the producers of new learning. Therefore, I have usually phrased the commonalities in terms of learning. And because these terms provide the materials for a subsequent sketch of collective learning, I will delineate my assumptions about them. The first of the five commonalities is the presence of "environing realities."

All social systems exist in environing realities.

It should be obvious that social systems of all kinds exist in the world and interact with it. Whether a family or the human species as a whole, a social system gets its energy, food, and materials from its physical environment.
And whether a business or a nation, a social system interacts with other social systems.

Three sorts of environing realities can be distinguished. The first consists of physical realities, both inorganic and organic. The second consists of social realities, including those outside the social system and those inside. I include a third sort of reality—spiritual realities—widely felt to be a part of our existence. While these may be described by such different terms as "God," "soul," "Atman," "ground-of-being," or "ultimate reality," they form an intense part of the experience of most human cultures.

Each existing model tends to focus on a particular aspect of reality. For instance, most of Argyris and Schon's attention is directed at internal social realities. But a general model, if it is to be complete, should account for interactions with all the environing realities, since each has important influence on the life of a social system. Even the spiritual realities, even if thought of as illusion by a modeler, deserve inclusion because beliefs about spiritual realities do direct actions of members of many social systems.

"Environing realities" suggests my meaning better than "environments." "Environments" as commonly used calls forth the notion of physical and biological settings; I wish to call forth the notion of all realities on which a social
system depends. Further, "environment" often overdraws the boundary between a social system and its world; I wish instead to picture a flux of interacting, overlapping realities.

These environing realities are "learnable." Members of social systems may study their nature and learn ways of dealing with them. Insofar as the survival, well-being, and satisfaction of a social system depend on its environing realities, it must be able to learn about them. Because environing realities meet real needs of real people, changes in those realities are important motivators for learning.

Each class of environing reality requires slightly different kinds of learning to account for the differing levels of predictability and purposiveness in their phenomena. Biologists use different approaches from physicists, social scientists from biologists, and mystics from social scientists. Different social systems may vary in their skill in learning about each of the kinds of reality. A complete model of collective learning should give an account of the full range of realities learned by different social systems.

Environing realities are not discreet entities separate from learners; in many ways they are the products of collective learning. At a physical level, for instance, the air in Los Angeles in 1960 was the product of the
collectively learned automobile culture; the air in 1983 is the product of collective efforts to reduce pollution. At a more conceptual level, the very view of "reality" is to a considerable extent a social construction (Berger and Luckman 1967). For example, Turnbull has described how the "same" physical forest is viewed as two very different realities by two cultures in Zaire (1965). The hunter-gathering Mbuti pygmies view the forest as friendly, animate, conscious—almost a mother or father. A group of villages, however, view the same forest as an enemy, literally to be beaten back, a source of evil. Environing realities, this is to say, are "learned"; they are the literal and conceptual products of social systems' collective learning.

A complete model of collective learning should reflect this interactive quality, by which environing realities are both products of collective learning and propellors of it.

All social systems are composed of learners

No one will dispute the second commonality—that all social systems, by definition, are composed of individual humans. And few will dispute that virtually all humans learn; even the most severely "retarded" humans learn some things. The capacity for learning is one of the hallmarks of our species. Since my concern is with collective learning, I will henceforth refer to members of social systems
as learners.

Any model which fails to include a description of the learner (as sometimes happens in the cybernetic models), simply is not representing the reality of social learning systems. Further, an eventual general model of collective learning will need to state and justify its assumptions about the nature of learners. These assumptions will affect what the model pays attention to and what it suggests as strategies for improvement of collective learning. There is a great number of questions about the learner that any model must address; we will mention only the most salient ones here.

What do learners learn? A model which thinks of learning as a change in behavior will be very different from a model which thinks of learning as involving a change in cognitions. Argyris and Schon would not have found what they did if they had confined themselves to behavior; by assuming that theories-in-use are inferrable, they pursued research revealing much about people's process of reasoning.

I favor the view that learning involves changes in cognitions. This is not to say learning does not lead to changes in behavior; it obviously does. But I view such changes as mediated by internal mental activity. This view is supported by the fact that identical stimuli may lead to less than identical responses, that children can generate an infinite number of never-experienced
sentences, and that organisms modify responses to achieve goals. In all these instances, the behaviors seem to have been more than a mere response to stimuli; they seem to involve mental mediation (Wallace 1970).

Various names have been given to mental constructs including "schemata" (Piaget 1969), "personal constructs" (Kelly 1955), "scripts" (Shank and Abelson 1977), and "theories of action" (Argyris and Schon 1974). However, each of these has its own meaning and sphere of concern. Since I wish to include learnings of all kinds, and to prepare the way for a description of collective learning, I will simply refer to all such cognitions as "lessons" and the totality of those cognitions as an "individual's lesson set." These are a "set" in four senses—as a group, as an organization, as a formation of habits, and as a preparer and conditioner of further learning. The lessons in the set are a vast network of interrelated cognitions able to be configured in countless ways for countless purposes. They overlap and are difficult to classify. For discussion, they may be seen to include at least the following overlapping sorts of learnings:

1. Lessons about environing realities, theoretical and factual knowledge about physical, social, and spiritual realities
2. Lessons about how to behave, practical social habits
telling what to do when, with whom, where, and how

3. Lessons about *technique*, skills, and technologies (other than social); instrumental, how-to knowledge

4. Lessons about *language*, about how to communicate

5. *Dispositional lessons*, feelings associated with things, attitudes, including the sensing of what is problematic or promising

6. Lessons about *purposes*, why-to knowledge, ethics, norms, and values, needs, interests, and goals.

7. Lessons about *learning*, how to find and solve problems, and how to teach others

I have not included instinctive lessons or genetic lessons. Over the long course of societal evolution, such "learnings" may or may not play an important part. A complete model should state its position on such factors, for instance on the effects of the "coevolution" of genes and culture suggested by Lumsden and Wilson (1981). My own inclination is to accept that coevolution is a factor over periods of tens of generations, but that collective learning is of far greater importance over shorter periods, and now is on the verge of controlling genetic change itself.

In this network of lessons, some are a more pervasive part of an individual's lesson set than others, and harder to "unlearn." Thus, Argyris and Schon have described how much more threatening it is for someone to question her central goals than it is to question instrumental tactical
lessons.

How do learners learn? Any general model must describe how people learn if it is to do justice to the wellspring of collective learning. Although no universally accepted theory of learning exists, the choice of learning theory is likely to affect the nature of the model. One based on Skinner's theory would stress schedules of reinforcement; one based on Piaget would pay attention to assimilation and accommodation. An eventual model should offer a grounded theory that integrates understandings from such fields as individual psychology, social psychology, and cognitive anthropology. For now, I will draw on elements from Dewey, Piaget, Argyris and Schon, Deutsch, Barnett, Fisher, Skinner, and others in a highly provisional sketch intended only to suggest what sorts of elements might be considered in an eventual model. In particular, I wish to highlight the issue about the ways an individual's learning is affected by her interaction with others. A paper diagram, however, cannot do justice to the fluid quality of mental activity, in which many things are happening at once. A computer model might come closer. Further, an adequate model must reflect the fact that learners learn in different ways, using reason, intuition, sensation, feeling, imitation, and judgment.
<table>
<thead>
<tr>
<th>Interactions with the individual's lesson set</th>
<th>Moments in the process of individual learning</th>
<th>Interactions with others and environing realities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Screened by interests, prior lessons</td>
<td>Perception and anticipation</td>
<td>Data Lessons from others</td>
</tr>
<tr>
<td>Strengthen existing lesson(s)</td>
<td>Fit existing lesson set?</td>
<td></td>
</tr>
<tr>
<td>Needs, experience (Ignore/Face?)</td>
<td>Yes → No</td>
<td></td>
</tr>
<tr>
<td>Unresolved dissonance aversive to learning</td>
<td>Ignore/Face</td>
<td></td>
</tr>
<tr>
<td>Better definition of problems.</td>
<td>Identify nature of dissonance, problem, or learning opportunity</td>
<td>Discussion with others</td>
</tr>
<tr>
<td>Experience of prior learning</td>
<td>Gather data and alternative lessons</td>
<td>Reality testing Communication with others</td>
</tr>
<tr>
<td>Dissociate and recombine</td>
<td></td>
<td>Discussion drawing on others' lessons</td>
</tr>
<tr>
<td>Especially central lessons →</td>
<td>Does new configuration harmonize with existing lesson set?</td>
<td></td>
</tr>
<tr>
<td>◁ Conflict ◀ Harmonize</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Test new configuration ← Results</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Goals</td>
<td>Satisfied?</td>
<td>Force of social standards</td>
</tr>
<tr>
<td>New lesson configuration. Greater disposition to learn</td>
<td>No → Yes</td>
<td>Communicate as part of</td>
</tr>
<tr>
<td>Institute as part of lesson set</td>
<td>Communicate to others</td>
<td></td>
</tr>
</tbody>
</table>

Figure 25. Some elements in the process of individual learning.
How free is the learner? Any model must make assumptions about the degree to which a learner's actions are determined or free, predictable or novel. The deterministic assumptions of behaviorists, for example, are likely to lead to a view of collective learning that is quite mechanical, structured, and reactive. Such a model could hold out the promise of prediction. On the other hand, the assumption that learners have some degree of freedom is likely to lead to a more existential model, less concerned with prediction than action.

While I cannot review here the ancient debate about freedom, I will admit my preference for the view that all learners have the capacity for choice, freedom, and unpredictability. The extent to which that capacity is exercised may be to some extent "determined" by socio-cultural influences. Indeed, one of the "variables determining" the effectiveness of collective learning may be the degree of freedom and novelty encouraged in learners by their social systems. At any rate, in my view, the term "learning" cannot have its full meaning without such freedom; without it learning is confined to "adaptation."

How social is the learner? There can be varying assumptions about the degree to which a learner is a separate, autonomous monad living in its own world and the degree to which the learner is a social creature, influenced by others and influencing them. A model built on an atomistic
view of learners is likely to resemble a billiard table with balls knocking against each other. A model based on a more fluid social view might more resemble a weather system, whose currents move and blend with each other.

I prefer the more fluid view. No one lives alone; feral children are rare and do not survive without human intercourse. Without social intercourse one remains what the Greeks called an "idiot," a purely private person.

There is a large body of current thinking to support the view that learners are both products of social intercourse and producers of it. George Herbert Mead has argued persuasively that minds arise through social intercourse (1962). In his view, thinking is a form of internalized conversation (p. 375). We become self-conscious intelligence through the reflexive action of language, pointing out meanings to one another. "Out of language emerges the field of mind" (p. 133). "Mind can never find expression, and can never come into existence at all, except in terms of a social environment" (p. 223).

Mead, and later Erikson (1968) have argued that the growth of one's sense of self depends on social interchange and mutual mirroring.

Piaget recognized the importance of the social matrix for the development of a child's reasoning (1969). Thus, "decentration" is only possible through the child's experience of others in social interactions. Lawrence
Kohlberg has noted that the development of a person's moral reasoning is prodded by exposure to someone else's reasoning at a slightly higher level (1966).

Many anthropologists have shown the extent to which a learner's mode of thinking is a function of his culture. Jack Goody has argued that the development of print and literacy has allowed people in modern societies to think differently from those in earlier traditional societies (1977). Writing permits lists, formulae, and tables; it permits skeptical and "constructive rumination" across time and space. Luria observed illiterates using concrete, context-bound modes of solving problems, while schooled people used more abstract logical operations (1976, 1979).

All these views support the perception of the learner as a social creature whose thoughts and thinking are largely a product of his interactions with others. In this way a learner is socialized to his culture.

The relationship is not one way, however. To be social is to interact. Others influence me and I influence others. As Berger and Luckmann have argued, the result is a dialectical process in which man collectively produces a social world, which acts back on its producers, who internalize its order in the process of socialization, in an unending cycle (1967).

In this social process, there are some parts of an "individual's lesson set" which are relatively accessible.
to other people and some that are not, as diagrammed in figure 26.

![Diagram of accessible and private lessons](image)

Figure 26. Individual lesson set.

This is not the same as Polanyi's distinction between tacit and explicit knowledge (1962). As he shows, knowledge that is tacit can be conveyed even if it cannot be told, as happens when a master conveys nonverbalized skills to an apprentice. Here, I am concerned with the distinction between what can be conveyed and what cannot. The lessons which are accessible provide the material with which collective learning proceeds.

The boundaries between accessible and private are gradual and flexible. What is accessible to a friend may not be to a stranger. What was unconscious and private before psychoanalysis may monopolize conversation afterward. In one organization, there may be very little accessing of one another's lessons; in another, a great deal.
Do learners differ? To say that learners are socialized to their cultures is not to say they are all the same. Even genetically identical twins are exposed to differing experiences, which form differing individual lesson sets. A model of collective learning which ignores these differences ignores the attribute by which collective learning is more than individual learning. Just as two people's experiences are certain to have differed, so will their lessons. This may prod the two to search for lessons which can accommodate the full scope of their experience. Social interaction between unique individuals can be a goad toward understandings broader and more universal than that achievable by an individual learning alone.

Why do learners learn? A complete model should account for what motivates learners and toward what ends they learn. There is not space here to review the range of thought on motivation, nor to support a view here. But, as a first step, I will at least state my assumptions as I now hold them.

Across a variety of explanatory systems, it seems to me, there is a common theme— that learners seek a more satisfying harmonization of their lesson sets and their worlds. Dewey sees inquiry as "the directed or controlled transformation of an indeterminate situation into a determinately unified one" (1938, p. 17). Piaget describes learners as in a continual process of "equilibration" to
bring their schemata into balance with reality. Through assimilation of data and accommodation of schemata, the schemata are enriched to make maintenance of equilibrium easier over a broader range of environmental demands (1969). Leon Festinger's theory sees people as seeking to reduce dissonance between their cognitions (1957). But learners may not just try to reduce dissonance; under favorable conditions they may seek out questions (Arlin 1975). In Polanyi's terms they may have "heuristic urges," personal commitment with universal intent (1962). But such searches for truth may not be possible until more pressing basic needs have been satisfied (Maslow 1954, 1968). And, at a physiological level, Donald Hebb posits that organisms seek an "optimal level of arousal" (1949). At the level of social organizations, March has suggested that members "satisfice" rather than seek optimal solutions (1953). Cangelosi and Dill have observed that the prime movers in organizational learning are stresses--"performance stress," when performance does not meet goals, and "disjunctive stress," or conflict between groups and individuals (1965).

In all these views, the learner may be seen as seeking a more satisfactory harmonization--a reduction of dissonance, and a fuller understanding of the world. This may include harmonization of bodily needs through learned behaviors, harmonization in social relations, in personality,
harmonization of spiritual impulses, and harmonization of lessons. In all these cases, needs are being met through actions mediated by mental activity. Learning seeks to alter the lesson set in a way that better harmonizes the lessons with each other and the learner with her world.

**Summary.** All social systems are seen to have learners. Any general model must state its assumptions about the learner. Mine are that learners have lesson sets with which they seek to harmonize the elements of their experience. Learners are social; they and their lesson sets are the products and producers of society. They exchange lessons, and that exchange enters into the process of individual learning. Each learner's experience and lesson set are unique; by comparing them, learners are prodded into expanding the range of their lessons beyond the confines of their own experience.

**All social systems have collective lesson sets**

Every member of any social system brings with her an individual lesson set of the kind represented earlier in figure 26. Some of her "accessible lessons" are shared with others in the social system. Further, members hold in common certain central lessons with which they order their lives together as a social system. These relationships, for a dyadic social system, such as a married couple, are represented schematically in figure 27.
The "co-ordering lesson set" includes all the shared, learned understandings, habits, knowledge, and dispositions with which members of a social system order their lives together. It includes the kinds of lessons enunciated in the earlier description of the individual's lesson set. These are summarized in figure 28; to them is added an eighth sort of lesson, about modes of co-learning. So central are these modes of co-learning for a model of collective learning that I will treat them separately in the following discussion.

Figure 27. A dyadic social system.
It is difficult to imagine any group of people persisting as anything like a "social system" without at least a minimal co-ordering lesson set. A couple would have difficulty surviving without at least some shared understandings, goals, values, interests, and agreed upon rules of interaction. A church would hardly be a church without some shared beliefs. A scientific community could not function without common language, concerns, and standards. An industry requires a core technology. A nation rests on laws.
The lessons in the co-ordering lesson set are vital to a social system and are held by virtually all members of the social system. But there is a second vast set of lessons held by only some members but nonetheless accessible to others when needed. I call this the "aggregate accessible lesson set." It is that portion of the lessons, shown above in figure 26, which include all accessible lessons in all members' individual lesson sets. It does not include the widely held co-ordering lesson set, nor private lessons.

All social systems have such an aggregate accessible lesson set. A husband and wife, for example, are constantly accessing each other's lessons—about where he left the car keys, her second cousin's name. A business could hardly run without members being able to access each other's specialized knowledge—a salesman's experience with a customer, a lawyer's about new tax laws. The life of a society is made up of individuals sharing lessons, large and small. One of the functions of any social system is to pool lessons to accomplish purposes not possible in isolation. The ability of members to call on one another's separate lessons may be one of the hallmarks of a healthy social system.

There is no sharp demarcation between the aggregate accessible lesson set and the co-ordering lesson set. Lessons may vary in the percentage of members holding them,
in their governing force, and in their importance for the life of the social system. Thus the belief that all citizens should have the right to vote is probably held by virtually all Americans, has the force of law, and is clearly part of the American co-ordering lesson set. My belief that governments should foster societal learning is accessible to others but not part of the American co-ordering lesson set. In between there are lessons not so easily classified. Belief that liquor should not be sold was for a time part of American law, although held by only a portion of the population.

I will consider a lesson to be a part of the co-ordering set to the extent that it is held by all member learners, governs their interactions, and is central in ordering their lives together as a social system. To the extent that a lesson does not meet these criteria, it is part of the aggregate accessible lesson set.

Because the demarcation between the co-ordering set and the aggregate set is gradual does not eliminate its usefulness, anymore than the gradient between "green" and "blue" reduces the usefulness of those terms.

A helpful tool for describing such gradients is the "fuzzy set theory" developed by Lotfi Zadeh (1972, 1976). The anthropologist Willett Kempton (1973) used this theory to quantify the gradient of responses, classifying mugs, cups, and drinking vessels as subsets of one another. This
technique might be usefully applied by an eventual model of collective learning to distinguish members of the aggregate and co-ordering sets.

I will use the term "collective lesson set" to refer to the composite of all lessons contained in the aggregate accessible set and the co-ordering set. It does not contain those lessons which remain private to individuals.

It is important to recognize the extent to which lessons in the collective lesson set are "meta-individual" as well as individual realities. What I have learned is real for me; what I learn and is accessed by another is real for both of us. What the two of us have learned in order to co-order our relationship is real for us as individuals and real between us as a system of individuals.

That the collective lesson set is a "meta-individual" reality can be seen by considering the origins and destinations of lessons. They do not pop up from nothing; they emerge from an endless mixing of prior lessons among millions of minds. Newton said that if he saw farther it was because he stood on the shoulders of giants. The fact that he and Leibnitz both independently invented calculus at about the same time suggests that the collective lesson set of the time was finally ready for that invention, only waiting for individual inventors to recognize the emergent possibility. Kroeber (1917) has pointed to the frequency of simultaneous invention as support for the
supraindividual quality of culture.) This is to say that what an individual learns is "more-than-individual" insofar as it has origins in the lessons of other individuals.

Not only the origins but the destination of some lessons suggest a more-than-individual quality. When one member of a social system may access the lesson of another member, the lesson has in a way become common property. It is there for public use. What Newton learned has been used by countless learners since; the lessons outlived the original learner.

Some lessons in the aggregate accessible set become so central to the life of a social system that they become part of the co-ordering set, but they seldom arrive there without some alteration. The originator's lesson is usually modified by others, and recombined with other lessons in new configurations. Locke's philosophy did not make its way into the American co-ordering lesson set unchanged. Adams and Jefferson, supreme court justices, and others have reworked his ideas, and those of others, with less concern for the originators than for the learning tasks at hand. The constitution is a meta-individual creation.

The constitution, once created, became a reality with more-than-individual force. It set the rules which individuals were to follow. To it, millions of young Americans have been socialized, with little choice.
It channels our actions and learning, even as we go about its reinterpretation.

The meta-individual quality of the collective lesson set will be important in my discussion later about whether collective learning is distinguished from individual learning.

"Culture" as used by some cultural anthropologists refers to much the same sort of shared learned things as I include under the term "co-ordering lesson set." Unfortunately, not all anthropologists use the term in the same way; hundreds of definitions exist, not all of which put the learned quality at the center. Further, "culture" is now used by organizational theorists and executives to refer to organizational character. And "culture" to many means opera. If I were to use "culture" instead of co-ordering lesson set, I would be misunderstood by many. I would also break the continuity of my usage of "lesson sets" to describe individual, aggregate, and co-ordering levels of activity. Finally, I would lose the emphasis on the learned quality of elements in collective learning.

Like the first two commonalities--environing realities and learners--the collective lesson set is both a product of learning and producer of it. Such an important part of the ordering and enriching of a social system's life should be represented in any eventual model.
All social systems have learning fields

The fourth feature shared by all social systems is that they have what I will call "learning fields." By this I mean that at a given time a social system has a range of dissonances to resolve and a range of opportunities for exploration. It has potential learnings waiting to be learned.

I use the term "field" in two senses—as a space and as a charge. As a space, a learning field is the range within which a social system may learn and beyond which it cannot. Homo sapiens can now learn about quasars, but could not do so until the collective lesson set included radio telescopes. The learning field has enlarged.

As a charge, the learning field contains tensions and potentialities which energize learning. These charges may come from a variety of sources. The collective lesson set may be at odds with environing realities, by inaccurate or incomplete understanding of it. That may be the case for the United States lesson set as it tries to cope with changing realities in Central America. Or a charge may be engendered by conflicts between elements of the co-ordering lesson set, as in the conflict between the United States habit of hegemony and its belief in self-determination of peoples. But charges need not just be "negative," they may be "positive" as when the scientists Darwin and Wallace sensed within the collective lesson set the opportunity for
a new theory of evolution.

These charges are sensed by individual learners as agents of their social systems. But a social system may have a myriad of small charges, opportunities for learning. So it selects only some of them for collective attention according to the strength of the charge and the habits of the system. Thus, only a few issues achieve the status of what Schon called "ideas in good currency."

Each social system varies in the range of its field and the configuration of its charges, but all systems have some such learning field. It is in the nature of any social system that it is established to solve a certain class of problems. Each pays attention to a certain sort of issues and opportunities. A hospital responds to epidemics and invents solutions. A business is sensitive to problems with its profits and to opportunities in its markets.

An eventual model should somehow represent how a social system senses and responds to demands and opportunities for learning.

All social systems have modes of co-learning

The fifth feature common to all social systems is properly a part of the co-ordering lesson set. It is the modes by which members of a social system share what they have learned and change what they share. It is the means
by which learners access the aggregate accessible lesson set and reconfigure the co-ordering lesson set into more satisfying order. I call this "co-learning" because it involves the joint sharing of learnings and the joint learning of new co-ordering lessons. It draws on the co-ordering lesson set's language, tools, and social rules, which form filters limiting exchange between learners. It can be represented as shown in figure 29.

![Venn diagram with two overlapping circles labeled "Learner 1" and "Learner 2" and a central overlapping section labeled "Modes of co-learning".](image)

**Figure 29.** Modes of co-learning.

Any social system has some modes of co-learning. Members of any system are continually communicating with each other, exchanging what they have learned. However,
the mode for such communication might vary. In one society it may be oral; in another, oral, written, and electronic. In one business the exchange of ideas may be frequent, candid, and informal; in another it may be infrequent, defensive, and formal.

All social systems also occasionally modify their co-ordering lesson set, however slowly. Because the environing realities which sustain social systems change, so too must members change their co-ordering lesson set's methods of dealing with those realities. And because members live and think, they are likely to see new possibilities which alter the co-ordering set. Even the most traditional societies change. If they do not, they are not likely to survive changing circumstances. And in the modern world of rapid change, heavy demands are put on members of social systems to anticipate and respond to such change. It requires rapid co-learning.

Co-learning is composed of many functions. The method or style of fulfilling each of those functions may be seen as a sub-mode of a social system's overall mode of co-learning. A sample list of such sub-modes is shown in figure 30, drawing on the insights of the authors reviewed earlier. A moment's reflection should confirm that each of those functions is met in some way by all social systems. Deficiencies in meeting them result in
<table>
<thead>
<tr>
<th>Functions</th>
<th>Examples of varying modes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Storing lessons</td>
<td>Oral/literate/electronic</td>
</tr>
<tr>
<td>Accessing lessons</td>
<td>Random/intentional</td>
</tr>
<tr>
<td>Framing lessons</td>
<td>Testable/untestable</td>
</tr>
<tr>
<td>Channeling lessons</td>
<td>Single channel/multichannel</td>
</tr>
<tr>
<td>Distributing lessons</td>
<td>Elitist/populist</td>
</tr>
<tr>
<td>Concerting lessons</td>
<td>Hierarchical/participatory</td>
</tr>
<tr>
<td>Sensing learning charges</td>
<td>Real-time and gradual/crisis-oriented</td>
</tr>
<tr>
<td>Assigning specialized learning</td>
<td>Haphazard/planned retraining</td>
</tr>
<tr>
<td>Dissociating and recombining lessons</td>
<td>Informal-individual/structured-organizational</td>
</tr>
<tr>
<td>Testing lessons</td>
<td>Impressionistic/controlled/existential-experimental</td>
</tr>
<tr>
<td>Facing conflicts over alternative lessons</td>
<td>Denial/airing</td>
</tr>
<tr>
<td>Resolving conflict</td>
<td>Win-lose/win-win</td>
</tr>
<tr>
<td>Instituting lessons</td>
<td>Informal custom/formal law</td>
</tr>
<tr>
<td>Socializing learners</td>
<td>Planned/informal</td>
</tr>
<tr>
<td>Learning about collective learning</td>
<td>Haphazard/intentional</td>
</tr>
</tbody>
</table>

Figure 30. Constituent modes of co-learning.
the kinds of pathologies suggested by Deutsch. All these component modes of co-learning may also be seen on reflection to be the products of prior collective learning.

**Toward a typology.** One task for an eventual model will be to offer a typology by which the varieties of approaches to collective learning in different social systems may be classified. This would be useful for research, and for a practical assessment of real social systems. Paul Shrivastava (1983) has offered such a typology for organizational learning systems based on two dimensions: 1) the extent to which the learning systems are evolutionary or designed and 2) the extent to which they are individually oriented or organizationally oriented. An eventual general model of collective learning might pursue that path by developing a multi-dimensional typology based on the variation for each of the sub-modes listed in figure 30.

**These commonalities can be a basis for a general model**

To review, we began with the question whether the diversity of social systems share enough commonalities to permit a general model. I have argued that all social systems share enough commonalities to permit a general model. I have argued that all social systems have environing realities, learners, collective lesson sets,
learning fields, and modes of co-learning. Each of these is both the product of prior learning by the social system and the producer of further learning. As such, they provide grounds for answering that a general model might be possible, at least in principle.

The development of a general model is still a long way off, however, with many issues yet to be resolved. The resolution of those issues will, I hope, be easier with the terms and clarifications we have made thus far.

**Defining Collective Learning**

Any general model will need to clarify the sense in which it is using the term "collective learning," and why the term is appropriate.

We have already gained a sense of the diversity of possible responses to this issue in the models we have reviewed. Although each uses the term in a variety of ways, we may summarize them as follows. For March and Olsen, the term refers to organizational adaptation to the environment. For Argyris and Schon it is the process by which individuals detect and correct error in the organizational theory-in-use. For Deutsch it is a dissociation and recombination of the system's structures, channels, and resources to meet goals, change them, preserve the system, or preserve some higher values. For Habermas, it is the incorporation
in societal institutions of more developed modes of reasoning.

Attempts have been made to categorize the manifold ways in which the term is used. Argyris and Schon categorize theories of organizational learning according to whether the organization is primarily viewed as a group, an agent, a structure, a system, a culture, or as a political entity (1978, pp. 319-331). Shrivastava discerns four uses of "organizational learning": 1) as adaptation to the environment by adjustment of organizational rules, 2) as changes in shared assumptions and theories, 3) as development of knowledge about action-outcome relations, and 4) as the institutionalization of experience for better decision-making.

Another way to categorize models and their usage would be to see how they answer the following questions:

1. What is the intent of the model?
2. What sort of thing is a social system that it may engender collective learning?
3. What does collective learning change?
4. How is collective learning distinguishable from individual learning?
5. Who or what evokes that change?
6. By what process?
7. When is a given case of the process said to be complete?
8. By what criteria?
9. What energizes it, and toward what ends does it strive?
10. In what sense is this really learning, or is it merely a metaphor.

Obviously, different models would answer the questions differently. But an eventual general model will need to address these questions in a way that is compelling for a variety of perspectives. As one step in that direction, I will offer my own current provisional responses to each in turn.

What is the intent of the model?

While I have barely begun to describe collective learning, much less explain or predict it, I am clear about my own goals for an eventual model: that it aid people in social systems from the smallest to the largest to learn how to learn together to address the complex and lethal problems we confront.

What sort of thing is a social system that it may engender learning?

If a social system were unpeopled, "it" would not learn. Nor could a system of lobotomized and comatose bodies learn. A learning system requires the action of minds. Even computerized "artificial intelligence" systems have the seeds of mind planted in them in the form of
programs conceived by human minds in order to perform the initial intelligent functions for the system. Real social systems are composed of real people who have minds and who learn. It is they who perceive environments, sense problems and invent solutions. A social system, however, is not a mere conglomeration of learners; it is a system of learners who organize their learning and actions in order to satisfy needs not satisfiable in isolation. They share a co-ordering lesson set which frames their purposes and interactions. In particular, they have common modes of co-learning by which they share each other's accessible lessons, broadening the range of understanding beyond that possible alone. Through the modes of co-learning they are able to alloy their lessons into synergistic structures more powerful than their own. And through the modes of co-learning they are able to reflect on their co-ordering lesson set, and to agree to more satisfying modifications.

A social system thus engenders its own form of learning. It provides the structures, incentives and rewards by which individual learners turn their capacity for learning toward collective learning tasks.

What does collective learning change?

Collective learning changes the collective lesson set. At one level, it may change the aggregate available lesson set. At another, it may change the co-ordering lesson set.
Such change in the collective lesson set is preceded by changes in individual lesson sets. These may become part of the aggregate accessible set, and may eventually work themselves into the co-ordering set. At that point they will be part of the socialization of members. By definition, the lessons of the co-ordering set influence all members and are held by most of them. Thus a change in the collective lesson set is concommitant with changes in individual lesson sets.

Further, changes in the collective lesson set may cause secondary changes. They may cause changes in the physical and social environments. They will change the learning field, discharging certain dissonances and creating others. And as noted earlier, they may act back on individual learners, socializing them to a new lesson set.

However, the primary focus of change in collective learning is the collective lesson set.

How is collective learning distinguishable from individual learning?

Individual learning changes the individual lesson set; collective learning changes the more-than-individual collective lesson set. It is critical here to recall the discussion earlier about the "meta-individual" qualities of the collective lesson set. There I argued that when a lesson becomes part of the aggregate accessible set it takes
on qualities different from it as an individual's learning. It becomes public property. It takes on a certain dynamic of its own. It may outlive the original learner. It gets mixed, analyzed, and reconfigured with other lessons by countless other learners. And if it becomes part of the co-ordering lesson set, it takes on even stronger meta-individual qualities. It has the force of law or custom on member learners. New members are socialized to it, with little choice. It prods, channels, and limits the direction of further learning.

However, this distinction between the individual and meta-individual is a matter of some dispute among anthropologists. Alfred Kroeber argued (first in 1917) that "culture is superorganic and superindividual in that, although carried, participated in, and produced by organic individuals, it is acquired; and it is acquired by learning" (1948, p. 259). In this view culture is transmitted, it persists beyond and above individuals and their societies, and largely determines their lives. It is a cumulative and joint product "that is enormously bigger than any individual man" (p. 255). It is like a coral reef formed over thousands of years by trillions of polyps secreting calcium carbonate, whose lattice is the current home of living polyps.

Homer Barnett had a different view:
... cultural facts are never anything else but ideas. In dealing with culture we are inevitably dealing with multi-individual ideas, that is, with ideas shared by more than one person. But this sharing does not take the ideas into a new plane. It does not make them supraindividual with an autonomy of their own. They are no different from any other ideas. They have the same principles of thinking as idiosyncratic ideas. They do not act with forces and features of their own, and assuredly they do not behave like wind and stone. (1953, p. 15)

The difference between Barnett and Kroeber persists among anthropologists according to Roger Keesing in a review of theories of culture (1974):

But we are still left between the horns of a conceptual dilemma: on the one hand, of cognitive reductionism that misses the magic of shared symbols and the only partial overlap between the psychological world of the individual and the code of cultural meanings and conventions; and on the other, of a spuriously autonomous and spuriously uniform world of cultural symbols freed from the constraints of the mind and brain by which cultures are created and learned and through which they are realized. (p. 57)

This is a slippery issue not easy to resolve. What is clear is that if Barnett is entirely right, then there is no important or valid distinction to be made between individual and collective learning. In this view, "collective learning" would be sloppy verbal shorthand for what is in reality learning occurring only in individual minds.

I will try to address this issue by considering the following two questions. Who or what evokes a change in the collective lesson set? By what process?
Who or what evokes a change in the collective lesson set?

Perhaps some of the difficulty we have just discussed can be resolved by examining the full nature of the entity through which collective learning occurs, and the nature of the process.

Consider someone sitting under an apple tree, eating an apple. If she asked, "What produced this apple?" she might answer, "The tree." But, after a bite, she might ask, "What produced the tree?" and answer, "An apple's seed, growing in the soil under the rain and the sun," savoring the whole.

Similarly, I sense that we need to overcome partial views and try to see the subject whole. If we treat individual learners as if they are not in intimate interaction with their social systems, then we miss part of their life. If we treat social systems as if they are not composed of quirky learners, then we miss part of their life.

Barnett is only partly right. He is right that ideas reside in minds, but he forgets the social origins of minds. Following George Herbert Mead, I view mind as arising from the exchange of ideas in social, lingual intercourse. Lessons do not simply "reside" in minds; they build the residence. Building does not happen in isolation; it requires at least some social discourse. Of course, a learner does spend time alone rearranging her residence.
But many of the materials came from town.

The very process of individual learning usually involves the influence of others and their ideas, as I tried to suggest above in figure 25. A learner's process has social dimensions.

So, yes, it is learners who learn for a social system. It is they who perceive environing realities, sense changes in the learning field, examine the collective lesson set and devise changes to it. But they do not do so as isolates. They do so as social learners whose minds and learnings are formed in social interchange. The apple grows on the tree.

But this is still only part of the answer to the question. We need to acknowledge the tree. A social system is not just an agglomeration of individuals; they are joined in a more-than-individual organization to accomplish purposes not attainable in isolation. Their activity is prodded and channeled by the co-ordering lesson set. Their power arises from their ability to access each other's lessons via the modes of co-learning. And these modes format discussion, screening, and decision, leading to changes in the collective lesson set. These changes are the product of more-than-individual things—the modes and dynamics of the social system as a whole.

A social system does not exist in a vacuum, however,
anymore than a tree exists without soil and air. Changes in environing realities may prompt learners to change their collective lesson set. Lessons learned from other social systems may stimulate a change.

In short, the who or what which brings change to a collective lesson set is a social whole. It is a social system composed of socialized and socializing learners, operating under a more-than-individual co-ordering lesson set, and responsive to the influence of data from environing realities and lessons from other social systems.

**By what process is the collective lesson set changed?**

*The dialectic.* The essential process required for collective learning to proceed is a dialectic between individual learners and their meta-individual collective lesson set.

Without learners to reflect on the collective lesson set, collective learning would not be possible. They sense whether the lesson set satisfies, whether it is in harmony with realities and with itself. They do the dissociating and recombining of lessons. Together they decide on new configuration of the collective lesson set.

But they are products of their social systems' collective lesson sets. They cannot learn without them.

Thus, there is a continual back and forth interplay.
Individual learners and meta-individual lesson sets are products and producers of each other. We have seen many examples of this in our prior discussion and I need not elaborate further here. What is important is to recognize that this dialectic is a necessary part of collective learning.

This dialectical view, in conjunction with the wholistic view just discussed, may provide a degree of resolution to the dilemma presented by Barnett's position. This view acknowledges both the reality of individual learning and its influence, and the reality of more-than-individual forces, dynamics, and structures.

The flow. In this dialectic, the influence of society on the individual may often seem much more direct and powerful than the influence of individuals on society. The path can be a long one from the origination of a lesson by an individual to its incorporation in some form in the co-ordering lesson set.

Accurately describing the nature of that path and process will be one of the major tasks for any eventual model. I do not have the empirical material on which to ground such a model. However, it is possible to glean from existing literature suggestions about what some of the elements of an eventual general model of the process might be. In particular, the model of "public learning" offered by Schon, the models of organizational learning offered by
Argyris and Schon, and March and Olsen, the model of "revitalization movements" offered by Wallace (1956), and the model of "knowledge diffusion" offered by Rogers and Shoemaker (1971) are all grounded in extensive empirical research. From these I will draw elements for the following provisional sketches of aspects of the process of collective learning. The sketches are offered to highlight issues and possibilities.

The most basic outlines of the flow are clear, and are summarized in figure 31. A socialized and socializing learner learns something new. She does so in something like the process shown earlier in figure 25, that is, interaction with others and her environing realities.

![Diagram](attachment:image.png)

**Figure 31.** Overall flow of collective learning.
If what she has learned is not private, she may convey it to others; it may become part of her social system's aggregate accessible lesson set. Her mode of communicating with others about the lesson is conditioned by the social system's modes of accessing, storing, framing, channeling and distributing lessons. If the lesson arises primarily out of interchange with environing realities, it adds, however slightly, to the depth and range of understanding of reality possible for the social system as a whole. Insofar as the lesson is unique, it is a goad to a broader, more universal understanding. If the lesson is primarily about the collective lesson set, it is a prod to self-understanding and integration for the social system. Any new lesson adds to the possibilities for dissociation and recombination and reconfiguration of the collective lesson set. And it enlarges the resources for individual learning. In all these ways, the addition of a lesson to the aggregate accessible set is important for the social system and its members. I will call this addition "aggregate learning."

The aggregate accessible set may also be diminished. For instance, members of an organization may be laid off, die, or grow fearful and closed. Records may be destroyed. I will call this "aggregate lesson loss."

When a lesson becomes part of the aggregate accessible set, it may in certain circumstances become material for a
reconfiguration of the co-ordering lesson set. I will call such a change "co-ordering learning" to contrast it with "aggregate learning."

Both aggregate learning and co-ordering learning are the products of a collective process, but in varying degrees. Aggregate learning is a collective product in at least two ways. First, as I have argued earlier, a lesson offered by an individual is not solely his own creation. He could only use it by calling on the socially created collective lesson set of the social system and of the culture at large. Second, it can only be part of the aggregate accessible set if he is able to convey it to others. But such conveyance depends on collectively created language and collectively created modes of communication. Aggregate learning is both an individual and collective achievement.

Co-ordering learning is a collective product in much more intense ways. Like aggregate learning, it builds on the prior collective lesson set and depends on collective language and modes of communication. But it alters the co-ordering lesson set. That affects all members of the social system, not just a few. And it may affect their fundamental ways of understanding the world and ordering their relations.

As such, co-ordering learning is a much more widespread and conflictual process than aggregate learning. This is not just because some members and subgroups have
interests in the maintenance of the status quo, which is usually true. And it is not just because the re-ordering may call for individuals to unlearn culture-wide habits acquired from birth, though this too may be true. It is also because of the importance of order itself.

Without order humans feel what Berger and Luckmann (1967) call "anomic terror." During periods of chaos, people in collectivities rush to "mobilize a system of beliefs to reestablish social order" (Smelser, 1963). This is consistent with the view I expressed earlier that the central impulse for a learner is to establish a more satisfying harmonization of his lesson set and his world. Learners seek order.

But this presents a conflict for learners is a social system. A major source of order is the co-ordering lesson set. To question it is to threaten disorder. But without such questioning and dis-ordering, it is not possible to re-order a more satisfying lesson set. Learners' needs for order can be both a prod and barrier to co-ordering learning.

The method of dealing with that paradox is one of the central determinants of the character of a given social system's collective learning. It varies with the quality of the modes of co-learning listed earlier, especially with the modes of facing and resolving conflict. A better understanding of these modes is likely to be one of the key
contributors to an eventual general model.

Co-order learning can be seen to involve a number of phases, as sketched in figure 32. The sketch relies heavily on Wallace (1956) and Schon (1971). In each of these phases the tension is evident between keeping the old order and establishing a new one.

Co-order learning is preceded by individual learning which leads to aggregate learning. The lessons involved are ones concerned with the co-ordering lesson set. The individuals who come up with important new ordering ideas are often under great stress (Wallace 1956). They may be so intimately familiar with the old order that they are painfully aware of its limits for satisfying the need for order, as happens with scientists in paradigm crises (Kuhn 1972).

The new lesson is communicated and gains acceptance with a subgroup of the social system. The members of the subgroup are ones for whom the benefits of the new order outweigh the risks of abandoning the old. This may be because they are young, alienated, or cosmopolitan. By being a group, they provide each other with the needed sense of social order.

But the group seldom accepts a new lesson as is. As a group they reconfigure the lesson, recombine it with others, and adapt it for broader consumption, cohering and extending their social order.
Function

Individual learner learns new lesson about co-ordering

It is added to the aggregate accessible lesson set

Sub group adopts

Sub group reconfigures

System wide crisis or demand

Conflict between sub groups

Conflict resolution by force or discourse

Trial incorporation into co-ordering lesson set

Regularization and socialization

Figure 32. Phases in co-ordering learning.
The innovation may remain only a subgroup's unless a crisis or demand arises which forces most members of the social system to question elements of the existing co-ordering lesson set. This may be of the same sort sensed earlier by the innovators and subgroup.

The crisis engenders intergroup conflict. Some groups hold fast to the old order, others zealously advance their own. All are responding to the same threat to order. The stakes are high, and so is the level of conflict. A social system's success in dealing with this phase in a way that leads to a more satisfying order depends on its modes of facing and resolving conflict. Some modes may deny conflict; others may air it. Some modes may resolve the conflict through power struggles; others may seek creative blend solutions that dissociate superficially conflicting goals from shared core goals and that reconfigure the lesson set to meet these core goals (Eiseman 1977).

After such conflict the co-ordering lesson set is likely to be altered in at least some respects, possibly incorporating substantial elements of the innovator subgroups' lessons. A period of trial incorporation may ensue, to confirm or disconfirm the worth of the new order.

If the configuration stands the test of time, it becomes a regularized part of the co-ordering lesson set. New members are socialized to it. Order is reestablished. Insofar as that order emerged from modes of co-learning
which encourage learners to acknowledge and test one another's claims and to create commonly satisfying resolutions, to that extent the new order is likely to have a broader range of application and satisfaction than the former. The members will have achieved co-order learning.

**Modeling intersystem influences.** The pattern I describe is based on others' empirical studies and proceeds from the dynamic of a central human urge—the urge for a more harmonizing order. However, much work remains until we have a general model demonstrated to hold for all kinds of social systems.

If a general pattern were found, it might then be nested in a way that could at once account for the learning of a focal system, its subsystems, peer systems and supra-systems. In programming terms, the general routine could be "called" when needed. Further, the mode of linkage of those routines would need to be specified. At this point I can only note the need and possibility of such linkage. A sketch of the interactions of collective learning by different systems is given in figure 33. The intersecting circles represent learners sharing a co-ordering lesson set and aggregate accessible lessons. The pattern shown for the "focal" social system is a general pattern that can be seen to be operating for the other social systems.
Throughout the flow and phases of collective learning shown in figs. 31 and 32, members of the focal system accommodate lessons from sub-systems, peer systems, and supra systems, contributing to the reconfiguration of the aggregate set and the co-ordering set.

Figure 33. Inter-system lesson exchange.
When is a case of collective learning complete?

The process of collective learning is long and complex. Individuals and subgroups are learning lots of things all the time, simultaneously. Not all that activity leads to a complete sequence of learning, but the partial learnings engendered in individuals and subgroups may be material for other learning. Further, there is a gradient of commitment and permanence in the collective adoption of any new lesson.

For purposes of discussion, I will consider a case of aggregate learning to be complete whenever something one learner has learned is made accessible to others in the social system. This happens constantly.

Co-order learning is only complete when most members of the social system are socialized to a new lesson.

By what criteria is learning to be assessed?

Any eventual model will need to be clear about what sorts of changes are to be included as "learning." Should all changes to the collective lesson set be called "learning," or just some? This is important because no model can escape embodying a set of values, whether tacit or explicit.

One approach would be to specify criteria which must be met before a change in the collective lesson set may be
called "learning." Examples might be that a new lesson increase the range in time and space of the environmental realities accounted for in the collective lesson set. Another might be the increase in the satisfaction and happiness of members. Another might be increased effectiveness in meeting goals. Another might be whether the new lesson set meets more universalizable standards of truth, goodness and beauty. Another might be the extent to which the learning is the result of unconstrained discourse and reason.

The advantage of specifying criteria is that it makes values explicit. For instance, it would reject the adoption of Nazism by Germans as "learning" because it was evil.

A second approach would be to admit any change whatsoever to the collective lesson set as an example of learning and then apply standards of evaluation to the result. In this approach the adoption of Nazism by Germany might be seen as adaptation to defeat, and depression, but such "learning" would then be evaluated as evil by obvious criteria. This approach need not imply any lesser commitment to moral and intellectual values. It simply distinguishes between the process of learning and the evaluation of its results.

I am not sure what the best resolution of this issue is. My current inclination is to accept any case
of a socialized change in the co-ordering lesson set as a case of learning, and then to apply criteria for evaluation of it. One reason is that, as I have argued, all such changes result from the cognitive activity of learners, no matter how limited. To that extent, the result may be considered learning. A second reason for taking this approach may be clearer after I have answered the next question.

What energizes collective learning, and what are its ends?

I am assuming that all humans seek an optimal level of consonance. They seek order. They try to make sense of the world. In the terms I have used, learning seeks a more satisfying harmonization of lesson sets and realities.

Collective learning is energized when charges develop in the learning field. These may be because of changes in realities, differences of views between learners, or dissonances noticed by a learner reflecting on lesson sets.

In all these cases, learners seek to reestablish a harmonized order. But because the experience is social, it prods learners to seek ordering concepts broader than they might think of if not exposed to others' experience.

If the resolution of dissonance is denial or the
imposition of a view by force, then the level of learning is very low. But my faith is that such resolutions will not last long. They will be forced again and again to confront opposing views, so long as there is any social life.

I am here confessing a faith that in the long sweep of social history, progress toward broader and more universal lesson sets is almost inevitable. It is built into who we are as people who compare experience and seek harmonizing orders.

This faith is tested by short-term setbacks. But I see most of those arising because the collective learning process was constrained. Nazis burned books, suppressed dialogue, and confronted others' claims by slaughter.

It is for this reason that I sense an evaluation of collective learning to be so vital to our predicament. If we can reveal how to achieve the kind of inquiry based on trust advocated by Argyris and Schon, and the unconstrained discourse advocated by Habermas, then perhaps we will have fewer Hitlers. Perhaps then we will advance more surely toward a more inclusive order. Maybe then my faith would seem fact.

In what sense is this learning, and in what degree metaphor?

It should be clear by now that I take the notion of
collective learning seriously, as more than momentary metaphor. I see it as learning because it arises from learners and because it adjusts social wholes to realities. I see it as collective because member learners, their collective lesson sets, and their environing realities are mutually interacting participants in the process.

**Next Steps**

Modeling is iterative. My discussion has been meant as a provisional clarification of the kinds of issues which any general model of collective learning must confront.

To achieve a valid general model, a collective learning process will be required. Differing views from differing disciplines will need to be dissociated and recombined into an order that satisfies the range of perspectives. Specific propositions will need to be advanced and tested.

The rewards could be social systems—from families to schools to nations to the human species—better able to deal with their changing realities, more able to engage with each other in open inquiry, and more able to establish a satisfying order.
The first goat my daughter saw, she recognized--she'd seen it in a book.

I have no doubt she'll soon be out looking for a unicorn.

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