A General Model of Communication

コミュニケーションのモデル

by

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1.0 Introduction

In this paper, we shall outline a general model of communication and illustrate certain uses of that model for improving human understanding of human communication — present and future.

Our approach to the study of human communication is through scientific method. We intend to build on the solid accomplishments of many others who have contributed to the field in the past. In order to do this, we have found it necessary to approach some of the troublesome and persistent questions by an indirect path. In particular, to understand how *human* communication differs from non-human (or inhuman) communication, we find it helpful to start with machine-machine communication systems and, step by step, to build up to human-human communication systems.

Two of the thirty articles in the Universal Declaration of Human Rights focus on critical dimensions of human communication; these are Articles 19 (information) and 20 (association) which are reproduced below:

Article 19:	"Everyone has the right to freedom of opinion and expression; this right includes freedom to hold opinions without interference and to seek, receive and impart information and ideas through any media and regardless of frontiers."
Article 20:	"1. Everyone has the right to freedom of peaceful assembly and association. 2. No one may be compelled to belong to an association."

In article 19, we are especially concerned with the worldwide *imbalance* between the receive and impart (send) functions. In Article 20, we are interested in the nature of communicative association (relationships) necessary to preserve and enhance humanness, especially in the case of extensive human-machine communication.

The leap from a general model of communication to the Universal Declaration of Human Rights, at first encounter, may seem impossibly large. To dispel that notion, we must first briefly examine some recent developments.

1.1 Scientific Revolution

All of us are involved in a communication revolution of an unprecedented magnitude and strength. On this statement, or some variation of it, we can secure wide agreement. But if we inquire directly about the nature of this "revolutionary elephant," even the wise ones among us humans will describe quite different features. To one, the global reach of the communication satellite is most startling. To another, the capacity of broadband cable excites wonder. To another, being able to converse with a computer in a natural "human" language blows his "mind". Others will insist that the jet plane which moves at the "speed of sound" while transporting tourists, students and businessmen to distant places for purposes of communication is the single most important "engine" of the communication revolution. The development of communication technologies has been and promises to continue to be explosive — beyond human description, beyond

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present experience.

In this bewildering on-rush of technology, we humans sometimes fear for our humanness. We are unable to say to our "multicultural" satisfaction what it means to be human. Yet, many of us feel that communication and humanness are inseparably interlinked. To change communication, it seems, is to change what it means "to be a human being human."

In our attempts to comprehend what is happening in the field of communication, we have in recent years focused on technology-lead changes. The technology, it turns out, is a confusing and often misleading place to look, unless the on-looker has a plan or model.Technology is most often a form of applied science and, therefore, we suggest that a model for observation can be drawn from scientific method itself. For in addition to a technological revolution in communication, the field of human communication is also in the early stages of a major *theoretic* revolution. Once that fact is grasped and the outlines of the theoretic revolution are clearly seen, a number of patterns begin to emerge.

It is necessary to be precise on what constitutes a scientific revolution. We turn to Kuhn:

> "The... transition to a new paradigm is scientific revolution... Confronted with anomaly or crisis, scientists take a different attitude toward existing paradigms, and the nature of their research changes accordingly. The proliferation of competing articulations, the willingness to try anything, the expression of explicit discontent, the recourse to philosophy and the debate over fundamentals, all these are symptoms of a transition from normal to extraordinary science (Kuhn, 1970: 90-91).

We take the Kuhn description of a scientific revolution as also describing fundamental and radical changes underway at this time in the field of human communication.

Before discussing the "general model" which gives this paper its title, it is necessary to discuss briefly a broadscale revolution underway in many fields of science.

1.2 From Classic Science to System Science

The term "general" in the title comes from General Systems theory and points to a system approach to science that departs radically from the two-hundred year traditions of classic science. While this science-wide revolution has been discussed by a number of scholars, Ashby, perhaps, says it most simply:

> "So arose the remarkable growth of scientific knowledge from that day to this. But there remained one major difficulty. The method was essentially analytic. Faced with a system, the scientist responded almost automatically by takint it to pieces. Animals were anatomized to organs, organs microscoped down to cells, cells studied as molecules, and molecules smashed to component atoms. The method of analysis tended to become dogma; and, in fact, the reductionists tended to assert that all science was to be advanced in this way alone... Any attempts to consider interactions of realistic complexity raised such great difficulties that, in practice, the reductionists always left the task of putting-together to someone else."

Ashby continues:

> "We might sum this up by saying that 'Classic Science' was in fact actively reductionist, in that it consistently tried either to remove all interaction between parts or to minimize it, or to make it infinitesimal, or to say it did not exist. This attitude was eminently suitable for many physical and chemical systems, but there were other systems, especially in the biological sciences, in which the interactions were not merely large or important but were actually the center of interest. For such systems 'classic' methods were inadequate or even misdirected. So arose the science that frankly accepts interactions as its starting point and then studies the system in ways that preserve, instead of removing, the interaction (Ashby, *Behavioral Science,* 18: 2-5, 1973).

the revolution in human communication theory, then, can be seen to be a particular instance of the more general revolution involving a shift from Classic Science to System Science.

In the next section, we shall present a general model of a dyadic communication system.

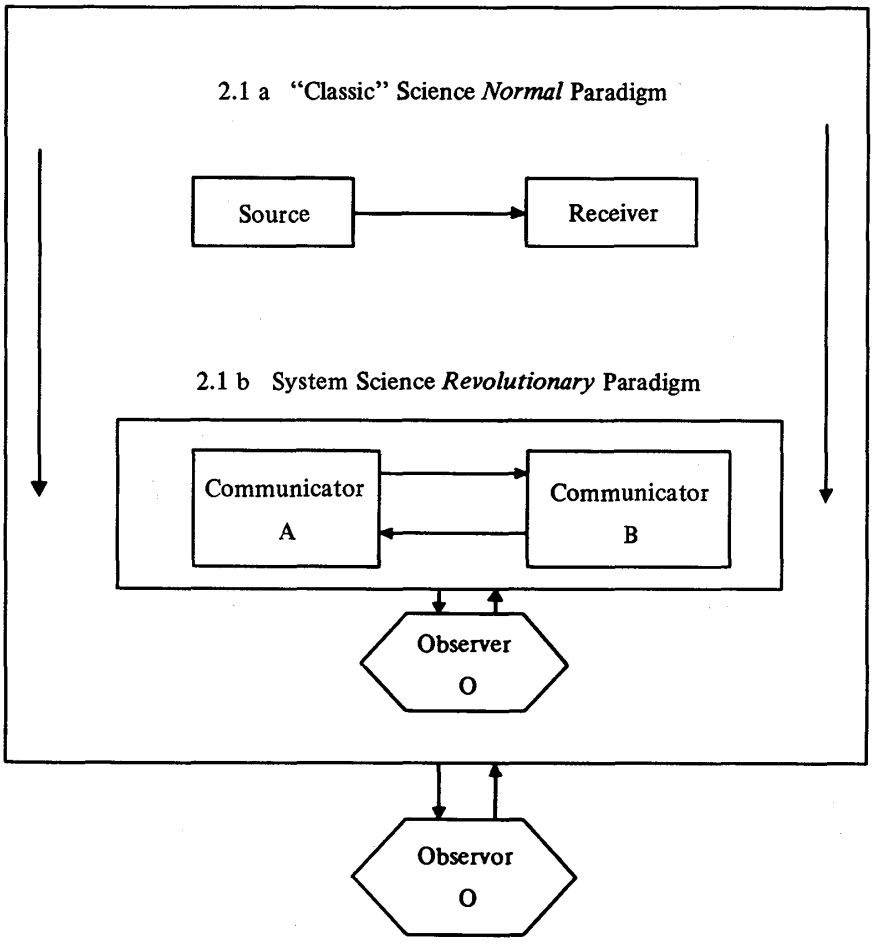
2.0 General Model

The terms model, paradigm and theory are used interchangeably in this brief paper. In a longer presentation, useful distinctions would be developed among these concepts. What follows in this section is based on a system view of communication; the central assumption is that the field of communication is in the early stages of a revolution in which the normal paradigm is first set aside and subsequently re-integrated into the revolutionary paradigm.

2.1 Classic to System

As in the case of science more generally (the Kuhn and Ashby statements) the shift of interest is from a "normal" paradigm within the framework of Classic Science to a "revolutionary" paradigm within the framework of System Science. That shift is shown in Figure 2.1. Note that Figure 2.1a shows the Classic Science model while Figure 2.1b shows the System Science model.

Figure 2.1. "Classic" Science to System Science Transformation



The Classic Science model shown in Figure 2.1a is in its simplest and most general form. It expands into most of the communication models now shown in the introductory chapters of basic textbooks in the field including those by Shannon, Berlo, Lasswell, and many others. It is characterized by Source A transmitting a prepared message through some channel to one (several, many)

Receiver(s) B to achieve a source determined purpose. The central goal is manipulation.

The System Science model shown in Figure 2.1b is also simple and general. Note that both A and B are Source/Receivers, or in a word, Communicators. In this model, Communicator A and Commumicator B as they are communicating within a system to achieve a *mutual* purpose, generate a unique message. The central goal is synergy (an outcome of a system achieved by joining of components) and, at times, serendipity (an unanticipated but highly creative outcome).

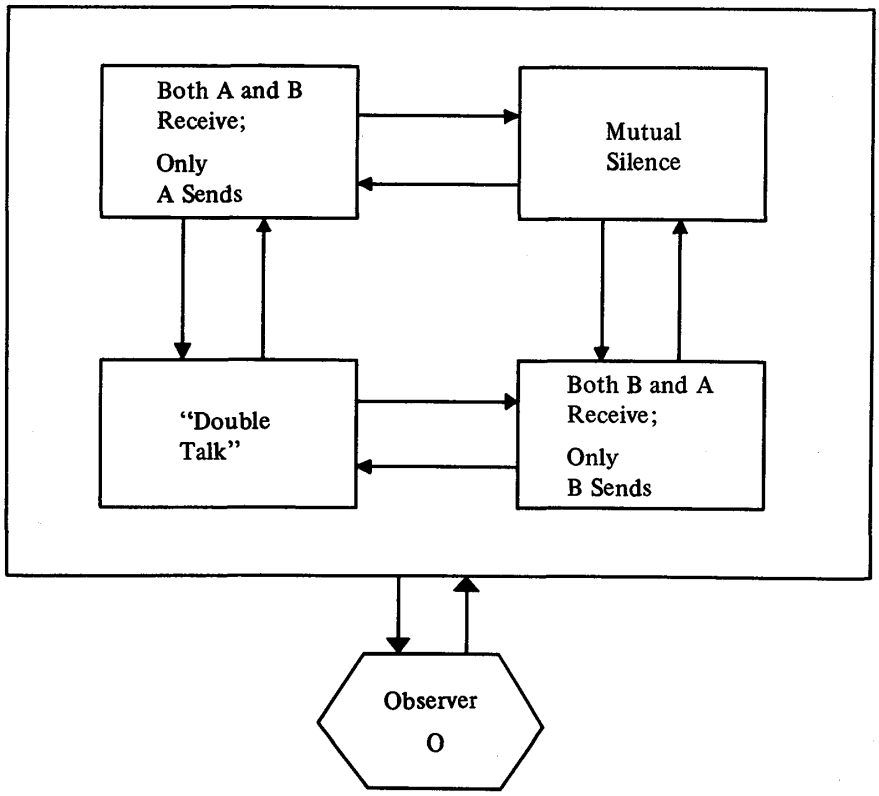
The linear, Source-Reciever model of communication was exceeded when a feedback arrow was drawn from the Receiver to the Source. As the Receiver came to be "granted equal time," the model became stretched out of line. Also, the Katz Two-Step Flow takes a vital "step beyond" the linear framework of Classic Science. In a later section, the priority of communication needs reverses the order of the two-step flow. On re-examination of primary documents, the careful reader will find a number of other indicators of the beginning of the shift from Classic Science to System Science, from linear cause-affect to mutual-causality, from one-way to two-way, from manipulation to synergy/serendipity, etc. The main outlines of the shift can now be simply diagrammed. The details will be worked out over time.

We think it important that methods be developed for re-interpreting one-way Classic data and information within the two-way System framework. The model presented in the next section is intended to be a step in that direction.

2.2 System States

A system is either in one of its several states or in the process of moving toward one of those states at any instant while it is in operation. In the case of a dyadic communication system, a simple four state system can be used to illustrate the point. Thus, Figure 2.2 shows four system states:

Figure 2.2. System States



Both Communicator A and B receive; only A *sends.*

Both Communicator A and B receive; only B *sends.*
Neither A or B sends or receives; mutual silence.
Both A and B send *and* receive; "double talk."

Even from this simple four state model, several comments can be made about the focus of past research. For instance, little attention is paid to the "effect" of what Communicator A sends on A as a "receiver," even though Skinnerean operant conditioning has much to say on this point. The timesharing problem in a communication system can be explored in terms of communicator-switching patterns and that information can be integrated with information obtained from auditory feedback, "internal junction," noise studies, and so on. The work of Jaffe and Feldstein, Black and Goldman-Eisler is especially interesting. Many other examples could be supplied. Even a minor elaboration of the general model, then, suggests both re-combination of past research findings and future research directions.

An important strength of system science lies in the fact that systems which in their physical form appear quite different are upon examination shown to be quite similar. This matter is, of course, especially important in the middle of a communication revolution.

2.3 Comparative Systems

The general model presented can be expanded and extended in a number of ways. In this section, only a single cross system comparison will be sketched out. Figure 2.3 illustrates one such series of comparison.

Our intention is to begin as simply as possible, that is, with a Classic Science linear, one-way machine-machine system with minimal feedback. Fortunately, there are substantial data for systems of this type. Importantly, systems of this type are "designed." They are man-made. Thus, the performance characteristics of such a system can be precisely known. Step-by-step, we intend to add complexity into the machine-machine system until it approaches (or exceeds?) the complexity of a human-human dyadic system.

As is shown in Figure 2.3, we plan to work from machine-machine systems through human-machine systems on to human-human systems. While we find human-machine systems as a class to be very interesting, we are most concerned with discovering what is unique about human-human communication. We consider it important to be quite precise at this point.

As you know, we are now at the stage in the development of communication technology where it is possible to develop almost any such technology that we need. The funmamental problem is that we do not know what communication technology we need; we do not know very much about human communication needs. We know very little in a systematic way about what styles of communication decrease and enhance humanness.

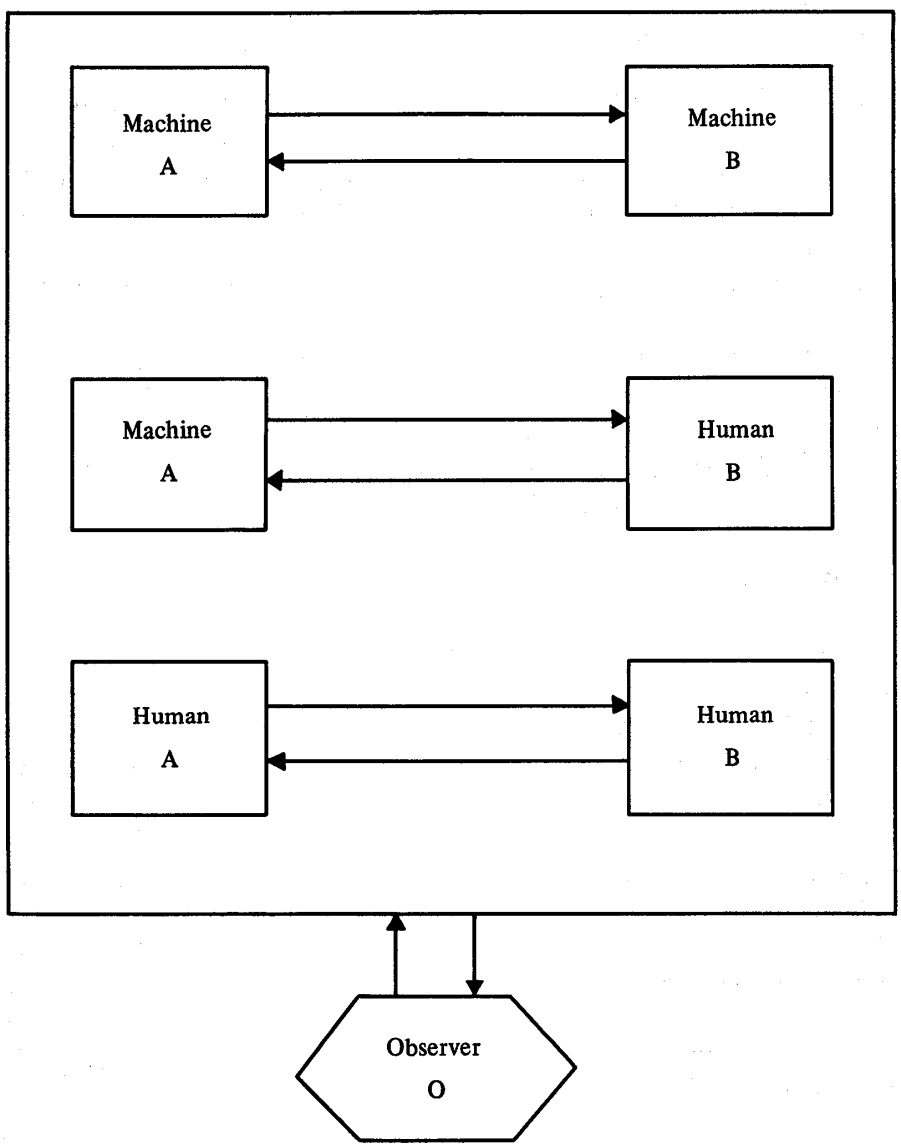
Before moving on to a brief outline of communication needs, it should be pointed out that the general model of the dyadic communication system shown here readily expands to the small group communication system of 7 ± 2 communicators and the large group communication system of (7 x 2) + n communicators. Equally, these systems can be shown to require either a telecommunication or transportation link, and such linkages can be shown to form two glabal communication networks. Thus, it becomes meaningful to talk about the adequacy of world communication facilities for the nearly four billion of us humans who inhabit planet earth.

3.0 Communication Needs

As it becomes possible to state more clearly what is involved in being a human communicator, the question arises: What communication opportunities does a human *need* to maintain and enhance his humanness? Or to state the same question more generally: What are the Communication Needs of Man.

Until quite recently, say until 200 years ago, the communication needs of man were similar

Figure 2.3. Comparative Systems



community to community around the world. In general, these needs were known. But today, not only the flood of new communication technology, but massive changes in other areas re-shape human communication needs. For instance, a world culture seems to be emerging at the same time that there is a re-surgence of interest in the cultures of the local community. In economics, the growth of regional trading blocs and multinational corporations proceeds in parallel. Both population and pollution are large-scale problems that require coordinated small-scale actions. To survive, the human communicator must adapt to new conditions; he has new but difficult problems in identifying needs.

3.1 Primary Needs

As Katz rediscovered in the second-step of the Two-Step Flow, there are fundamental human needs that are not included in a linear Source/Receiver model of communication. The general model takes the Katz second step as fundamental and his first step as of lesser importance. A body of research shows the importance of association, relationship, interaction, "emotional involvement" in human communication. Today, the possibility of deprivation and overload is real and awesome.

The primary human communication need is a bio-social one. It depends on information sharing and communicative association in the family and the community. For any individual communicator, his primary needs can be filled by a small number of different communicators — probably fifteen or less.

3.2 Secondary Communication Needs

The secondary communication needs arise out of the fact that a human's need for information exceeds his capacity to build full range associations (friendships). Thus, he needs to be able to acquire reliable information from "impersonal sources" (probably 200 or more) at a reasonable cost. Survival in the city depends, in particular, on the availability of vast quantities of information.

3.3 Tertiary Needs

The tertiary needs, as a class, are ambiguous. In large part, they appear to arise from frustrations of primary or secondary needs. These needs are served, although quite awkwardly, by the "mass media."

4.0 Communication Rights

Communication needs, as they become better known and better understood, are likely to be quite numerous. What appears as possible is to group communication needs into classes, and, for each class of needs, to derive a single class-wide principle. Those principles could then be transformed into a Declaration of Communication Rights.

4.1 Send/Receive Imbalance

Some 200 years ago in Europe, Classic Science and the print revolution gained momentum at about the same time. Thus, an imbalance was begun that continues to this day. The list of characteristics of that imbalance would be very long, particularly when viewed from the perspective provided by the general model of communication presented here.

That imbalance is most widely evident within the framework of the Universal Declaration of Human Rights. Article 19 assures every human of the right "to seek, receive and impart information." Today, we are all victims to a greater or lesser extent of an "information imperialism." Only a "few" have access to the facilities for imparting (sending) information. "Most" humans can only receive. We are not yet free to seek information in the sense of "user activated" systems even though the technology already exists for building such services on a large scale. Article 20 assures every human that he cannot be coerced into an association. Yet, to obtain the information necessary to survive, a human is forced into the type of association arranged for him by the mass media. He is required to become a passive spectator. This observation merely elaborates the point made earlier that the Source/Receiver model of communication is fundamentally manipulative. A system model simply makes apparent how humans are manipulated.

It is now possible to think seriously about a fair communication policy. When based on a clear specification of need, Articles 19 and 20 can be coordinated and extended into a full range Right to Communicate.

4.2 Interdependence

It has been observed that all men are brothers and, yet, all brothers are different. As we who live in this changing world become more interdependent, our communication needs also change. The need for better human communication has never been greater.

5.0 Summary

In this paper, we have outlined a system approach to the study of human communication. The notion of revolution was examined and the shift from Classic Science to System Science was discussed. A general model was presented and some possible uses in discovering the human dimensions of communication were suggested. Finally, emerging questions in communication needs and communication rights were posed.
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