Modeling the Communication Process: The Map is Not the Territory
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Shannon and Weaver's "transmission" model of the communication process has long been recognized as inadequate for describing the complex process of human communication except in the limited context of radio-telephone communication for which it was originally developed. In spite of numerous criticisms and attempts to postulate new models, none of the alternatives has been widely accepted.

From a practical standpoint, the principal problem with Shannon and Weaver's model is that it evaluates communication based on the efficiency of the channel. In an effort to account for more of the components of the communication processes, subsequent researchers focused attention on the components of the communication process, communication reaction, and the semantic reaction. A new communication model incorporating both syntactic and semantic aspects of communication is required.

The Practical Application of Communication Models

If you were to stop reading right now and sketch a model of the communication process, what would your model look like? What components would it contain, and how would these components relate to each other? Even if you don't actually produce a model, think for a minute of what your model of the communication process would look like were you to draw it in actuality. That model is your map of the communication process in the semanticists' sense of the word. It governs the way you think about the communication process and influences the ways in which you communicate. And, as Hayakawa (1978) has said, "no matter how beautiful a map may be, it is useless to a traveler unless it accurately shows the relationship of places to each other, the structure of the territory" (p. 27).

For this reason, the accuracy of your mental map of the communication process is an important component of that process. An accurate model facilitates communication because it reflects the truth about the communication process. As is true of all maps of all territories, models of the communication process need to simplify, to provide a symbolic representation that helps individuals "see" and understand the thing itself.

Our purposes here are to present a brief overview of the most significant models of the communication process, to evaluate the communication models of greatest relevance to business communication, and to establish a foundation for a new conception of that process. Subsequent articles will present the theoretical framework for a new communication paradigm, the

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dynamics of pragmatic communication, and semantics management and acts of ideal communication.

THE NATURE OF COMMUNICATION

Hayakawa (1978) has said that language is the most "highly developed, most subtle, and most complicated" of human symbolism because "anything can stand for anything." The ability of language to symbolize with virtually unlimited flexibility makes it both the most powerful tool for progress and greatest potential source of human difficulty. Language and communication occupy the central role in human activity and make possible the analysis and synthesis leading to knowledge and wisdom, but after thousands of years of recorded history, we still do not fully understand what happens when two people communicate.

This question has plagued many of the world's best minds at least since Aristotle. Language is both commonplace and enigmatic, both superficially simple and infinitely complex. In spite of extensive speculation and a body of literature much too broad for complete examination here, language and the communication process have remained more in the world of mystery than in that of science.

Aristotle, Descartes, Locke, Russell, Wittgenstein, and numerous other philosophers have provided guides to the interpretation and analysis of language in an effort to make language more logical and to bring the communication process under rational control. The natural consequence of that line of thought is Science and Sanity, by Alfred Korzybski (1958; first published in 1933), which essentially established the field of general semantics. In that landmark book, Korzybski replaced static verbal theories of meaning with a more dynamic and organic approach emphasizing the role of semantic reaction in the communication process.

Although his contribution to an understanding of the communication process has been both praised and condemned, Korzybski's replacement of "meaning" with "semantic reaction" helped focus attention on phenomena induced in the human brain by communication. Korzybski provided a comprehensive framework for human cognitive and behavioral processes, most notably the concepts of abstraction, delineated with the Structural Differential and the Silent and Verbal Levels (see Johnson, 1974); the environmental and social influences on those processes; and the technical media solutions to the problem of message transfer. For Korzybski, the message itself is a vehicle for informing only, which we will contend is one of the communication subprocesses. Nevertheless, Korzybski and the general semanticists, the best known of whom are Wendell Johnson (1946) and S. I.
Hayakawa (1978), were concerned with what should be the central issue of the communication process: how messages create change in the sender and receiver.

In recent years, most researchers concerned with the practical application of communication have all but ignored the complicating issue of the semantic reaction and have focused their attention on the behavior of the communication channel and the components of the communication process. In part, this is a natural result of the development of modern communication channels.

**THE CHANNEL CAPACITY PARADIGM**

The advent of electronic communication channels, primarily two-way radio, naturally suggested that all human communication shared the characteristics of the electronic channels. In spite of the years since its development, the best known model of the communication process is the one postulated in 1949 by Claude Shannon and Warren Weaver. Originally developed to explain electronic transmission of data, the Shannon and Weaver model has been pressed into general service because of its seeming simplicity and its foundation in scientific principle.

In keeping with concepts that apply to communicating by telegraph, radio, and telephone, Shannon and Weaver’s model depicts communication as linear, a series of steps in which a message is conveyed from a source or sender to a destination or receiver, and “communication” is defined as the replication of the original message at the receiver’s end of the transmission. For this reason, the Shannon and Weaver model has become known as the “transmission” model of the communication process. Figure 1 illustrates the basic components of this process.

![Figure 1. The Transmission Communication Model](image-url)
This model has its philosophical roots in Hartley’s conception of the communication process (1928), which defined information as the successive selection of signs or words from a given list. Most important for our discussion here is Hartley’s rejection of all “meaning” as subjective: “We transmit physical signals; we do not transmit their meaning.” For Hartley, and for the Shannon and Weaver model that followed, interpretation is not part of the communication process. The words on Hartley’s list and the signals transmitted in the Shannon and Weaver model contain no significant, human meaning.

According to this model, if person A reads a list of randomly selected nonsense words to person B, and person B is able to repeat those words, communication has taken place. And to a certain extent that is true: B would indeed have received “data” from A. In terms of communication, neither Hartley nor Shannon and Weaver would distinguish between the successful transmission of nonsense words and that of meaningful sentences: both would constitute “communication.” As Cherry (1966) and others have pointed out, the transmission model focuses on the most basic aspect of the communication process: the syntactic aspect. If the syntax (simply the order of words or other data) remains the same from the sender to the receiver, communication has taken place regardless of how different the ideas (what Korzybski would call the “semantic reaction”) may be in the minds of the communicators.

For this reason, Cherry and numerous others have criticized this model. Cherry lamented that the mathematical concepts forming the basis of the transmission model “have been called ‘information’ at all.” And about ten years later (1977), both Pauly and Bowman and Branchaw criticized the transmission model for neglecting central aspects of the communication process. According to Pauly, “The transmission model has enabled us to sidestep genuine problems that we ought to be facing” (p. 21). To avoid the mental image of “bits” of communication being passed back and forth between a sender and receiver, Bowman and Branchaw added the concept of simultaneity to the basic transmission model in an effort to illustrate that human communicators send and receive messages at the same time.

Other researchers indirectly questioned the validity of the transmission model by postulating variations to account for specific applications. Herbert (1977), for example, added the concepts of opinion change and relationship change to the transmission model to indicate more precisely the goal orientation of administrative communication. Michman and Harris (1977) included a marketing channel in their model to incorporate the influences of the external environment, while Baskin and Bruno (1977) employed a transactional model of the communication process to argue for the centrality
of the psychological system as the "locus of meaning and thus the most important variable in the communication process" (p. 73).

THE COMMUNICATION REACTION PARADIGM

In spite of the seeming deficiencies of the mathematical model, it has remained the most enduring conception of the communication process. Alternative paradigms have generally been more complex and more difficult to understand. As early as 1948, for example, the mathematician Norbert Wiener (1965) attempted to change the direction of communication study away from the "naked information" of early mathematical models by emphasizing the meaning of the information exchanged. And in 1953, Carnap and Bar-Hillel expressly added a semantic level to communication modeling, in which meaning is considered in addition to the syntactic accuracy of the message received. In this model, propositions are evaluated for validity and meaning as well as for the accuracy of transmission (Cherry, 1966, p. 244).

In the Carnap/Bar-Hillel model, the information content of statements is based on the selective power they exert on ensembles of internal states. In other words, the recipient attributes value to a sender's statements according to the influence the information has on the decision making process and the degree to which his or her "state(s)" is (are) altered. In typical circumstances, a series of nonsense words would contain little or no information because the receiver would be unable to assign value to the words, and his or her internal states would remain unaffected.

The distinction between message and meaning implicit in Wiener and Carnap/Bar-Hillel is significant and clearly adds a necessary component to our understanding of the communication process. In 1953, Osgood—best known for his work with the semantic differential—postulated that meaning is contained in the social context as well as in the message and that communication "units" contain both nonverbal and verbal components. Schramm (1954) developed this idea further by adding encoding and decoding to the transmission of a message and including the concept of a shared field of experience, as Figure 2 illustrates.

![Figure 2. The Schramm Communication Model](https://job.sagepub.com/SAGEPublications)
Schramm was also convinced that communication between two people consisted of "message loops" in which each individual message was part of a continuing interaction between the people, each of whom alternately served as sender and receiver. From this point forward, virtually every communication model has included the concepts of social context and feedback.

The next major addition to the conception of the communication process was postulated by Thayer in 1968. Thayer was one of the first researchers to explicitly state that "The message a receiver 'gets' is almost always composed of factors which are well beyond the shared informational 'content' of the originator's statements or questions" (p. 123). Figure 3 illustrates Thayer's conception of how these other factors influence the communication process.

![Figure 3. The Thayer Communication Model](image)

For a variety of reasons, however, the promise of these models has remained essentially unexplored. Most investigations of communication theory still emphasize the mathematical approach, concentrating on the quantification of information "communicated" in nonhuman environments.

**THE S-R PARADIGM**

Another well-known solution to the problem of the meaning of a message has been to remove the mathematics from the Shannon and Weaver model...
and substitute verbal equivalents. The Berlo model (1960), for example, defines the components of the communication process as Source, Message, Channel, and Receiver, and provides verbal descriptions of how each affects the communication process (compare Thayer, p. 124). Berlo's approach provides some useful vocabulary for discussing the process and encourages an examination of the nature of the central components of the communication process. The mathematical model asks just one question: is the channel adequate? Berlo's model asks questions about other components as well, the most important of which concern the nature of the Source (S) and the Receiver (R).

The mathematical and semantic models rightly belong to the realms of mathematics and logic (whether Aristotelian or non-Aristotelian is not germane to our purpose here) respectively. The binary codes of computer communication, with their various formulas for verifying the accuracy of transmission, are the logical extension of the mathematical model. That model has its usefulness, as anyone knows who has used a modem to communicate text or binary files from one computer to another. Such models enable us to develop specific coding procedures and to anticipate and correct problems caused by noise in certain communication channels.

On the other hand, the mathematical models do not contribute significantly to our understanding of what happens when two or more people attempt to communicate. Such models can determine whether a particular text file was transmitted and received accurately, but they cannot address the issue of the meaning or value attached to the contents of that file. The clear transmission of a message, however, is ultimately less important to human communication than is the meaning conveyed. As receivers, we may hear only a partial message but obtain a clear understanding, or we may hear the complete message but with little or no understanding. Data may be exchanged according to the mathematical model, but communication does not take place until value or meaning is assigned to that information.

Because of their added layer of complexity, models containing a semantic level more closely approach a valid depiction of human communication. The meaning of words—the different values assigned them by sender and receiver respectively—provides the significant influence on the communication process. And what is more important for our purposes here, it also provides the significant influence on the behavior that may result from the communication process. Berlo, for example, stated that "Communication does not consist of the transmission of meaning. Meanings are not transmitted, nor transferable. Only messages are transmittable, and meanings are not in the message, they are in the message-user."
In addition to the syntactic component and the semantic component, human communication also contains a behavioral or pragmatic component. Not long after Berlo, Barnlund (1962) recognized that “Communication involves the total personality” and that thought and action cannot be separated, as “meanings [are] generated by the whole organism” (p. 199). Barnlund may have been the first to state that a person’s communication with him- or herself is an important component of the communication process as that self-communication influences meanings and actions. Barnlund also recognized that the behavioral component greatly increased the complexity of the communication process, as it is impossible to determine in advance and with certainty “the impact of any bundle of words upon the receiver of them” (p. 208).

The pragmatic component is not only the most complex, but also the generative component, the component without which the others would not exist (see Thayer, p. 124). The pragmatic component is the only level grounded in the reality of the communicators. That is, communication is a goal-directed activity in that it always has a purpose. While it may be argued that the purpose of communication is not always clear (to either the sender or the receiver), it is evident that every act of communication is initiated by some kind of goal-directed motive—to eliminate some source of discomfort or to achieve some pleasure.

Although many communication models incorporate an initial perception, which presumably gives rise to the decision to communicate, few expressly include this pragmatic element. This element, however, is fundamental. Semanticists, most notably Johnson (1946) and his popularizer Postman (1977), have discussed the pragmatic consequences of semantically faulty communication, but they have not incorporated these consequences into a unified theoretical construct, relying instead on what is essentially an intuitive understanding of the role communication should play in shaping human behavior (See Postman, pp. 21-36).

**The Contextual Net Paradigm**

In recent years, these basic communication models have been modified in an attempt to describe the kinds of distortion that enter human communication in ways not accounted for in either syntactic or semantic models. The literature here is extensive, but in general, communication models greatly oversimplify the complexity of human communication. Those based on the earlier transmission model continue to be subject to the errors Pauly deplored, and those rooted in semantics are forced to depend on individual interpretations of the abstract concepts of meaning and value.
While one of the functions of a model is to present a complex process in a simplified way to facilitate understanding, the models of the communication process most widely used today simplify at the expense of accuracy.

In an effort to overcome this problem, Figgins (1984) emphasized the way in which communication, as a dynamic process, changes the sender and the receiver, so that with each new message, sender and receiver become "new." Although Figgins does not say so explicitly, his model, depicted in Figure 4, correctly indicates that no communication has occurred unless change occurs in the sender and receiver.

![Figure 4. The Figgins Interpersonal Communication System Model](image)

The strength of the Figgins model rests on its clear illustration of the changes in sender and receiver in the process of communicating. Even so, the Figgins model seems to suggest that messages are packaged and sent as individual units: first A sends and B receives, and then B sends and A receives, and so on. Its main weakness, however, is that it provides too little information about the verbal and nonverbal cues and other perceptions that create meaning for sender and receiver. This has, in fact, been a principal weakness of recent communication models. Regardless of
how complex they become, most communication models fail to explain the very concepts that Korzybski, Wiener, and Carnap and Bar-Hillel considered essential to an understanding of the process.

Campbell and Level (1985), for example, correctly describe communication as goal-directed activity and rightly indicate that “communication is composed of more than the sum of the bits of information passed between people” (p. 45). To account for the complexity of the process, they added multiple “boxes” of symbolic interpretation, value systems, and external competition to the model, as Figure 5 illustrates.

Campbell and Level refer to their construct as a “black box” model because they do not attempt to examine the content of the various boxes depicted in the model and, in fact, state that such an understanding is not essential for understanding the system as a whole. In view of the foundation of their model in Shannon and Weaver’s basic construct, their illustration of this concept is significant: “an executive knows if he or she pushes a particular button and speaks, then the secretary in the next office will hear what is said . . . . How the black box (the intercom) functions and what electronic processes support the functions are irrelevant to the study of the conveyance of meaning between the two actors” (Campbell and Level, p. 44). Although the content of the box may be inferred from its influence on the system, such an inference would need to be based on an accurate measure of the change in a message passing through the box. Unfortunately, we suspect that mental “boxes” are not the same as the intercom—one would need to know the “contents of the box” before one could observe and measure the change in a message that passed through it. The intercom functions as a transducer of signals, not of meanings. We believe that Korzybski and the semanticists are right: how the “black boxes” function is central to the study of conveyance of meaning between human individuals.

In another model that addresses issues important to business and economics, Lewis (1987) attempts to incorporate both Korzybski’s concept of semantic reaction and the traditional concepts of the transmission model. Note that Lewis envelopes Person A and Person B in a “semantic net” and “frame of reference” and, in a way reminiscent of the Schramm model, shows that each serves as both sender and receiver.

THE CONSEQUENCES OF COMMUNICATION AND COMMUNICATION MODELS

Communication is clearly a complex process, and each of the models discussed thus far makes an important contribution to our understanding
Figure 5. The Campbell/Level Communication Model
of that process, especially in the context of business communication—pragmatic communication—with which we are primarily concerned. Even so, the models create as many questions as they answer.

Figure 6. The Lewis Organizational Communication Model

If we are to understand the communication process, we must have further explication of the semantic net (or semantic reaction) and the frame of reference than current models provide. Given that the broad categories of mathematical and semantic models actually depict the aspects of communication they are designed to elucidate, they still provide an incomplete picture of the process of human communication. Let’s look, for example, at a simple exchange between two people:

Man: Would you like to go out for dinner Friday?
Woman: No, thank you, I already have other plans.

According to the mathematical and S-R models, communication has taken place when each has received and correctly decoded (the same words in the same order) what the other has said—when the woman understands that she has been invited to dinner and the man understands that he has been refused. For the purposes of our discussion, we will refer to this as the surface meaning.

According to the semantic models, communication also depends on the meaning or value assigned to the symbols (words) used. Depending on the value assigned the various terms, our communicators would ascribe interpretive, logical, and psychological meanings to the exchange, which would influence their decision making processes and future communication—when the man and woman correctly perceive the meaning each attaches to the invitation and refusal (the “semantic reaction”). Such questions as (1) whether the man hopes to establish a continuing relationship, (2) whether the woman really does have other plans, (3) whether the purpose of the dinner is business or pleasure (or both) would need to be answered in similar fashion by the man and woman for communication to occur in a semantic context. We will refer to this level as the logical-psychological meaning.
Other levels of meaning are present but not fully accounted for by current models. As mentioned previously, Campbell and Level assign these levels to the “black boxes” with the generic label, “Symbolic Interpretation” but deliberately avoid examining the possible contents of each “box” (pp. 45-46). From a pragmatic standpoint, however, these levels are critical because they are the generative levels not only for the bulk of the psychological meaning but also for the behavior that results. In broad terms, this extremely simple exchange also has social meanings, economic meanings, cultural meanings, and other elements, all of which require exploration if we are to understand the way in which communication shapes—and is shaped by—behavior.

A New Paradigm: The Semantic Reaction

Very clearly the two major influences on our conceptions of the communication process have been the mathematical construct of Shannon and Weaver and the general semantics approach postulated by Korzybski. In many ways, the Shannon and Weaver model focuses on components external to the sender and the receiver. Korzybski, on the other hand, focuses primarily on matters within the sender and receiver but which sender and receiver have the ability to control through the correct use of language.

Undoubtedly, these are both important aspects of the communication process. In using these constructs as our image of the process, however, we are teaching ourselves to overlook one of the central facts about communication, namely that it depends on neither syntax nor semantics alone but on the accumulation of information, very little of which is actually exchanged during the communication process. Because the semantic reactions in the minds of sender and receiver depend more on the information each brings to the communication process than on the message communicated, even the best message properly delivered in a given situation may be misinterpreted. Others have, of course, recognized that the process of communication is itself imperfect. For those of us who would understand the process and teach it to others, however, such acceptance of communication’s imperfections should not be enough.

A new paradigm is needed to bring more elements of the communication process to light so that they can be discussed, measured, and evaluated. In our next paper, we will present a comprehensive model of the communication process that incorporates the syntactic and semantic aspects and provides the means of exploring the ways in which the “black boxes” of symbolic interpretation add to the meanings of messages.
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