Foundations of Communication Theory

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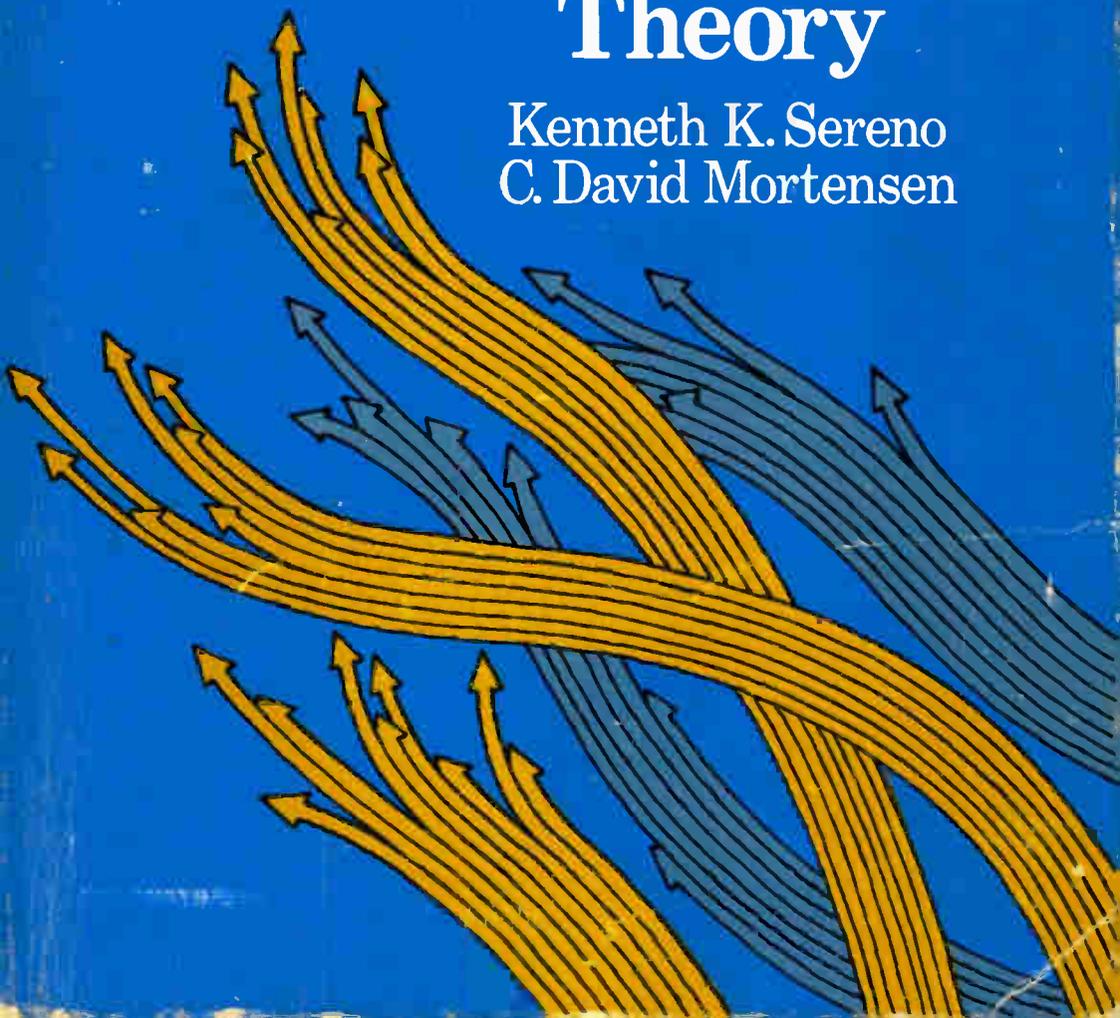
FOUNDATIONS
OF
COMMUNICATION
THEORY

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Under the Advisory Editorship of J. Jeffery Auer

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PREFACE

The term "communication theory" has undergone substantial change in meaning in the scientific literature of the past two decades. In the years following the influential publication in 1949 of *The Mathematical Theory of Communication* by Claude E. Shannon and Warren Weaver, scientists typically considered communication theory as strictly mathematical. Throughout the early 1950s, communication theory was regarded as synonymous with the narrowly defined and highly technical interests of information theory. In essence, the goal of the information theorists was to measure the amount of information that could be transmitted by messages over channels in systems like telephones or radios. Then came the many attempts to apply information theory to psychology, often under the rubric of "communication theory." As might have been anticipated, methods developed on unselective systems like telephones did not prove to be particularly fruitful in studying the highly selective nature of human information transmission and reception. Nonetheless, the application of notions from information theory to psychology did serve to underscore the need for a behaviorally oriented, synthetic theory of human communication. Consequently, numerous books and scientific journals, professional associations and academic curriculums now use the term "communication theory" to refer to a highly interdisciplinary, behaviorally oriented field of research dealing with the constituent processes of human communication.

This book is designed to provide a modest framework of foundational

knowledge about the nature of human interaction. Our point of view is that *a communication theory does not yet exist, at least not in any singular sense*; what the current literature affords is rather a core of theories related to particular phases of communicative behavior. Such theories represent four distinct levels of analysis. At the first and most inclusive level of communication theory, human interaction may be approached as a *system* of behavior. The next and somewhat more specialized level of analysis focuses upon the human component of a communicative act—the decoding-encoding process. A third level of theory aims at an understanding of the concept of *interaction,* that is, the particular means by which communicators are linked or "co-oriented" in any communicative exchange. Lastly, communication theory deals with the importance of the *context* or encompassing situation in which human interaction takes place. The book is so arranged that each major section corresponds with one of the four levels of theory discussed in the introductory chapter. The four levels of analysis form a broadly based and useful perspective from which to understand the dynamics of human communication more effectively.

Foundations of Communication Theory is designed to meet three needs. The first grows out of our conviction that communication theory is, in its own right, a subject worthy of intense and systematic instruction. This book is planned, then, as a basic text for an expanding number of courses in speech, communication, social psychology, and related disciplines that provide a core of fundamental knowledge about the constituent aspects of the processes of human communication. This book also may be useful as a supplementary text for basic courses in speech and interpersonal communication. Finally, the content may have utility as resource material for more advanced courses in persuasion, communication theory, group communication, organizational communication, social psychology, and mass communication.

Since the text is directed to the general reader, we included only those readings which contain (1) broadly based content, comprehensive in scope, (2) a behavioral and theoretical orientation to some fundamental aspects of human communication, and (3) material suitable for undergraduate students in introductory courses. The last consideration in every case could not be maintained without compromise. The reason is the result largely of the rather technical and specialized level of much current literature on communication. However, the topics discussed in this book (with possibly two or three exceptions) do not go beyond the level of technicality of most texts for college freshmen in the behavioral sciences.

The preparation of this book was truly a joint venture. All of the decisions grew out of a dialogue between the collaborators that lasted two years; consequently, the required decision about the order of names on the title page was resolved arbitrarily. Since neither of us can assign priority for specific decisions, each willingly assigns any oversights to the other.

We wish to express our appreciation to the many authors, professional associations, and publishers whose cooperation made this text possible.

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INTRODUCTION: A FRAMEWORK FOR COMMUNICATION THEORY

During the last decade, the outpouring of scientific research on human communication has increased at a staggering rate. This burst of research activity is due to the ever-widening usage of the term "communication" and to a declaration of vested interest in communication research by numerous scientific disciplines. One review of developments in the field lists more than twenty academic disciplines which currently provide content and method for research on some phase of human interaction.[1] The physical sciences contribute to the study of communication largely by way of technical subfields bearing the headings of cybernetics, information theory, and general systems theory. The social sciences embrace the inclusive interests of anthropologists, who define culture as communication, and the most specialized investigations of social psychologists, who define the relationships between individual and group activity as communication. At the end of the social science spectrum are the investigations of linguists, who describe their work on language structure as part of communication science. Still other approaches to the study of communication cross disciplinary lines of psychology.

[1] Franklin H. Knower. "The present state of experimental speech-communication research," in *The Frontiers in Experimental Speech Communication Research*, ed. Paul Ried (Syracuse, New York: 1966), p. 21.

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sociology, speech-communication, political science, journalism and many others. Finally, within another broad field of knowledge, the humanities—particularly rhetoric and philosophy—provide a rich legacy of tradition and doctrine on human interaction. Clearly, then, the so-called "science of human communication" is not, in any strict sense, a single discipline at all. The subject of human communication is rather, as Schramm indicates, an extraordinarily active focus of research investigation and theory.[2]

Though astonishingly popular as an object of research, the field of human communication has not established any sharply-defined boundaries or domains.[3] Much of the reason for the state of disarray is due to the lack of theoretical integration in the field, a problem noted by Hovland,[4] Fearing,[5] and others. The pace of research activity in recent years has done little to further specify or define the distinctive province of the communication field. One recent review notes the use of twenty-five different conceptions of the term "communication" in current research literature.[6] Investigators have yet to establish a completely acceptable definition of communication.[7] Nor do they share agreement as to what is common to the process of human communication. According to Bettinghaus, over fifty different descriptions of the communication process have appeared in print.[8] Similar conceptual problems limit the many attempts to formulate a general model of communication. Since the publication of a mathematical model of communication in 1949 by Shannon and Weaver,[9] over fifteen different models have been described in the literature.[10] In the absence of any universally acceptable conception of human communication, it is hardly surprising that the field is so often criticized as a "teeming wilderness of facts and notions, instances and generalizations, proofs and surmises . . ." [11] and as ". . . a jungle of unrelated

[2] Wilbur Schramm, "Communication research in the United States," in *The Science of Human Communication* (New York: 1963), pp. 1–16.

[3] The status of the field is reviewed by Lee Thayer, Editor's preface, *Communication: Concepts and Perspectives* (Washington, 1967).

[4] Carl Hovland, "Social communication," *Proceedings of the American Philosophical Society*, 92 (1948), 371–375.

[5] Franklin Fearing, "Toward a psychological theory of human communication," *Journal of Personality*, 22 (1953), 71–88.

[6] Lee Thayer, "On theory building in communication: some conceptual problems," *Journal of Communication*, 13 (December, 1963), 217–235.

[7] Robert Minter, "A denotative and connotative study in communication," *Journal of Communication*, 18 (March, 1968), 26–36.

[8] Erwin Bettinghaus, *Message Preparation: The Nature of Proof* (Indianapolis: 1966), p. 31.

[9] Claude Shannon and Warren Weaver, *The Mathematical Theory of Communication* (Urbana: 1949).

[10] Raymond Smith, "General models of communication," Communication Research Center, Purdue University (dittoed), 1962.

[11] Alfred Smith, Introduction, *Communication and Culture* (New York: 1966), p. 8.

concepts . . . and a mass of undigested, often sterile, empirical data. . . ." [12]

The foregoing discussion has important implications for the student of human communication. For one thing, the student should be prepared to evaluate the topics which embrace the communication field as they arise from a range of academic disciplines and traditions. An exposure to such heterogeneous subject material may contribute to the student's understanding of the extraordinary complexity of human communication, and may lead him to a more balanced perspective. It is equally important to keep in mind the fact that formal fields of knowledge seldom flourish because of the prior existence of a clearly defined set of theoretic principles or propositions. They develop rather out of the particular problems and research interests of those who originally give consideration to the particular field under study. The topics or "content" of such formal disciplines arise, as Roger Brown points out, from specific research investigations and problems, and with comparative independence of those topics encountered in related subfields of knowledge.[13] It would be difficult, for example, to isolate the single principle which separates biophysics from biochemistry, neurology from physiology, social psychology from experimental psychology. The study of human communication, likewise, is a historical development, a core of knowledge, and not a fixed theoretical construct. Hence, our understanding of the dynamics of human interaction must be established, as recognized in a recent symposium on communication theory,[14] facet by facet, concept by concept, dimension by dimension.

APPROACH OF THE BOOK

The readings in this book are designed to provide a core of foundational concepts and a theoretical framework for studying the nature and process of human communication. The topics are broadly based and comprehensive in scope. The readings focus on the inner workings of communication, the common denominators which underlie all modes of human interaction. Gaining an understanding of the dynamics involved in human interaction requires some insight into what happens when people communicate, a recognition of the forces which interact to produce complex communicative events, and an understanding of what is known about the effects of major variables as they influence specified communicative outcomes. The topics, in other words, do not deal with particular modes of interaction such as rumor, conversation, markings on a wall, speeches and the like. The focus is rather upon the nature and function of the major determinants of communicative acts.

[12] Bruce Westley and Malcolm MacLean, Jr., "A conceptual model for communication research," *Journalism Quarterly,* 34 (1957), 31–38.

[13] Roger Brown, *Social Psychology* (New York: 1965), p. xx.

[14] Lee Thayer, *Communication: Concepts and Perspectives,* p. iv.

The book also provides a particular orientation for studying human communication, one that is decidedly *behavioral* and *theoretical.* Before proceeding, it would be well to consider the sense in which the terms *behavioral* and *theoretical* are to be used.

A behavioral approach to the study of human communication is essentially a scientific one. What makes a science is not equipment or apparatus, but method and aim. As Homans aptly states, "If it aims at establishing more or less general relationships between properties of nature, when the test of the truth of the relationship lies finally in the data themselves, and the data are not wholly manufactured—when nature, however stretched out on the rack, still has a chance to say 'No'—then the subject is a science." [15] Consequently, the broad aim of science is to establish generalizations about nature which are supported by empirical evidence gathered in an impersonal and objective way.

Obviously, not all science deals with the lawfulness of the physical world. Among scientists, only social and behavioral scientists study creatures like themselves. Communication scientists, in particular, seek to establish behavioral laws regarding human communication. More specifically, the communication scientist strives, as Miller notes, to formulate statements which refer to regularities in the behavior of senders and receivers in given communication situations.[16]

A behavioral approach to human interaction presupposes that when people communicate, they do so totally. Communicative events involve the whole person. This means that communicative behavior cannot be considered as something completely distinct from the determinants of behavior generally: perceptions, learning, drives, emotions, attitudes, beliefs, values, decoding-encoding, meaning, messages, and social situations. Human communication, then, is not a single process, but a composite of processes—a set of complex, on-going forces interacting in a dynamic situational field that has no fixed beginning and no fixed ending.

Each activity which influences human communication is in itself a composite of interacting elements. Consider, at one level, the activity of the nervous system. In reference to the interaction of forces within the central nervous system, Lashley writes:

. . . theories of neuron interaction must be couched, not in terms of the activity of individual cells, but in terms of mass relations among the cells. Even the simplest bit of behavior requires the integrated action of millions of neurons; . . . I have come to believe that almost every nerve cell in the cerebral cortex may be excited in every activity. . . . Differential behavior is determined by the combination of cells acting together rather than by cells which participate only in particular bits of behavior.[17]

[15] George Homans, *The Nature of Social Science* (New York: 1967), p. 4.

[16] Gerald Miller, *Speech Communication: A Behavioral Approach* (Indianapolis: 1966), p. 26.

[17] W. Russ Ashby, "The application of cybernetics to psychiatry," *Journal of Mental Science,* 100 (1954), 116.

Add the almost unimaginable complexity of the nervous system to other processes—physical, psychological, and social—and you have some notion of the enormous complexity of forces which underlie the processes of human communication.

The orientation of this book is also, as mentioned earlier, theoretical in nature. This does not mean that the framework constitutes *a* theory of communication, for such a singular, full-blown theory does not as yet exist. What the readings afford are varying theoretical perspectives which advance specific propositions and relate communication variables to one another within a coherent, explanatory framework. Some of the theories, of course, are more powerful in their predictive and explanatory capacities than others. However, even the less powerful theories are useful, since they reveal assumptions, specify potentially critical connective factors, and postulate certain relationships among elements in the communication process. In other words, theories—even the weaker ones—add clarity and structure to our thinking about the nature of human interaction. And in addition to their organizational and heuristic values, the most powerful theories of communication specify or predict *how* selected variables will interact in producing specified outcomes, and help to explain *why* the outcomes occur. Not all the readings in this book are based upon predictive theory; some do not even explicitly use the word "theory." What all have in common is rather some theoretic base which has proven utility in studying human communication more effectively.

FRAMEWORK OF THE BOOK

The term "communication" may be defined as a *process by which senders and receivers of messages interact in given social contexts.*[18] Implicit in this definition are a number of assumptions about the nature of communication. The very notion of *process* suggests that the components of interaction are dynamic rather than static in nature and that they cannot be properly regarded as unchanging elements in time and space. Communication, as Dance observes, is something that changes even while one is in the act of examining it.[19] From an *interaction* standpoint, no single aspect of communication can be meaningfully understood apart from the other constituents of behavior; moreover, changes in one aspect of the process may result in modification of the other workings of communica-

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[18] Such a definition is similar to that developed at the SAA-USOE Developmental Conference held in New Orleans, February, 1967; and George Gerbner, "Mass media and human communication theory," in *Human Communication Theory*, ed. Frank E. X. Dance (New York: 1967), p. 43.

[19] Frank E. X. Dance, "Toward a theory of human communication," *Human Communication Theory*, ed. Frank E. X. Dance (New York: 1967), pp. 293-294.

tion.[20] Since the on-going changes which we are referring to include the re-
sponses of sender and receiver alike, the notion of interaction cannot be consid-
ered as a one-way transmission process. Interaction is rather reciprocal in na-
ture, a mutual exchange of conjoint influences, or what Newcomb refers to as the
co-orientation of each communicator toward the other party and the object of
their interaction.[21]

A process orientation has important implications for the way in which the
theoretical concepts in this book should be considered. For example, the message
linkage between sender and receiver is not to be thought of as a separate entity,
but rather as a changing object of orientation by the communicators. The partic-
ular object of the interaction may remain relatively constant or may shift rap-
idly to include, say, a gesture, a marking, a command, a threatening nonverbal
cue, a tension release—perhaps followed by a verbal agreement which culminates
in a signature. In other words, a *message* consists of any communication variable
which operates to link the interaction between communicators, one which affects
in a relatively simultaneous way the responses of all of those engaged in commu-
nication. Thus as individual perception of the situation changes, the type of linkage
shifts concomitantly. In a similar way the social context itself may be consid-
ered in functional terms as an integral aspect of the interaction, rather than sim-
ply being regarded as the "location" or "setting" in which communication takes
place. Human interaction never occurs in a vacuum. In short, a process orienta-
tion requires a conception of communication theory which is sufficiently compre-
hensive to account for all individual and social determinants of a given commu-
nicative act.

The literature on communication theory does not as yet offer *a* theory of
human interaction, at least in any singular sense of the term; but it does afford a
core of specific theories which pertain to various communicative processes.[22]
Each constituent theory contributes something akin to what the psychiatrist
Meerloo describes as a "probing action" around the subject, that is, a compre-
hensive theoretical orientation from different angles and from varying per-
spectives.[23] Therefore, the framework of readings will focus upon four inter-

[20] Cf. Introduction, *The Language of Social Research*, ed. Paul Lazarsfeld and Morris
Rosenberg (New York: 1955), pp. 15–18; Jurgen Ruesch, "Synopsis of the theory of human
communication," *Psychiatry*, 41 (August, 1953), 220–221.

[21] Theodore M. Newcomb, "An approach to the study of communicative acts," *Psycho-
logical Review*, 60 (1953), 393–404.

[22] The limitations of singular theories of communication are now readily acknowledged
in the literature. Cf. Lee Thayer, Communication and organizational theory, and Dell Hymes,
"The anthropology of communication," in *Human Communication Theory*, pp. 1–39, 70–115;
John Newman, "A rationale for a definition of communication," *Journal of Communication*,
10 (1960), 115–124; Lawrence Frank, in *Toward a Unified Theory of Human Behavior*, ed.
Ray Grinker (New York: 1956), p. 40.

[23] Joost Meerloo, "Communication and mental contagion," in *Communication: Concepts
and Perspectives*, pp. 1–23.

related yet somewhat distinct dimensions of theory: (1) communication as a s tem of behavior, (2) communication as decoding-encoding activity, (3) communication as interaction, and (4) communication in social context. Each section contains working assumptions, a distinct unit of analysis and, hopefully, a useful way of approaching and understanding human communication more effectively. From section to section the perspective shifts from an abstract, idealized view of human interaction to the distinctly human aspects (decoding-encoding functions), to specific types of linkages, and finally to the role of the social context in communication.

Each theoretical perspective entails great selectivity in what is being singled out for study. Some aspects of communication are invariably omitted in order to maintain a more direct focus upon the operations of some other aspects. It is important, therefore, to remember that the less abstract the unit of analysis, the more detailed will be the information gained. At the same time, however, the more specific the level of detail, the less will be revealed about the relation of the particular object of study to the larger framework. When the focus of discussion, for example, happens to be physiological mechanisms of receiver systems, one may lose sight of the importance of the situation in determining what each person filters out in his perception of the interaction. It is necessary, then, to remain conscious of the principle of non-elementalism, which insists that no single aspect of human behavior can be properly understood except as it relates to the whole.[24] To obtain some idea of how each of the four theoretical dimensions contributes to the overall foundations of communication theory, it may be useful to consider briefly how each dimension relates to the larger theoretical framework of the book.

COMMUNICATION THEORY: SYSTEMS

A communication system or model consists of an idealized description of what is necessary for an act of communication to occur. A model represents or *replicates* in abstract terms the essential features and eliminates the unnecessary details of communication in the "real world." Models differ widely, of course, in terms of *how* they represent human communication. Those models based upon a mathematical conception describe communication as analogous to the operations of an information-processing machine: an event occurs in which a *source* or *sender transmits* a *signal* or *message* through a *channel* to some *destination* or *receiver*.

In the social sciences, however, most communication models describe more than the sending—transmitting—receiving functions; they also replicate such factors as the *nature* of the interaction, the *response* to the message, and the *context* in which the *interaction* occurs. By abstracting what is common to all modes of human communication, a systems approach to communication theory provides

[24] Cf. Edward Mysak, *Speech Pathology and Feedback Theory* (Springfield, Illinois: 1966), pp. 20–21.

a frame of reference from which to better understand the workings of all communicative acts.

COMMUNICATION THEORY: DECODING-ENCODING BEHAVIOR

The human component is of central concern in all of the more "social" systems or models of communication theory. The minimal condition for human interaction of any sort is the maintenance of a more or less constant monitoring of the environment by the individual. This monitoring process consists of the sustaining of certain *decoding-encoding functions*. The essays in this section, therefore, will stress the importance of three interrelated yet somewhat distinct forms of sender-receiver activity: (1) perception or decoding, (2) cognition or interpretation, and (3) response or encoding.

COMMUNICATION THEORY: INTERACTION

The word "interaction" may be regarded as the process of linkage between senders and receivers of messages. This linkage process does not consist of the discrete action of individual elements working under separate powers; nor is it simply to be considered as a sort of balancing action of one element with another in causal connection. The process specifies interaction or linkages between or among countless factors, each functioning conjointly, so that changes in any one set of forces affect the operation of all other processes to produce a unique and total effect. Theoretically, almost any behavioral condition could influence the linkage process. A gesture, a predisposition, a connotation, a drive, an attitude, conflict, proximity of persons, poor eyesight, tension, group pressures to conform, trustworthiness—virtually any number of factors may play some part in determining the total communicative outcome. Some of the most important factors which influence the interaction of senders and receivers of messages are examined in the essays of this section. These include predispositional personality factors, source credibility, states of cognitive consistency or inconsistency, the nature and role of attitudes, and selected message variables.

COMMUNICATION THEORY: SOCIAL CONTEXT

Human communication is in no small measure influenced by the social context in which it occurs. The context or "encompassing situation" as Brockriede calls it, consists of an elaborate set of implicit conventions and rules which govern the origin, flow, and effects of messages. In urban life this on-going flow of communication is constantly changing as a consequence of the ever-widening variety of social settings available for social organization. In this regard Cox likens urban life to the activity of a vast and complicated switchboard where man is the communicator and the metropolis is a massive network of possibilities for communication.[25] Such a picture should serve as a reminder that the concept of

.rvey Cox, *The Secular City* (New York: 1965), p. 40.

social context must extend to far more than simply the effects of the immediate situation upon human interaction. The articles in this section first show how the immediate social setting influences communication in various small groups and then extend the concept of context to cover more inclusive situations in which information is transmitted from reference group to reference group and from sub-culture to sub-culture.

PART I
COMMUNICATION THEORY: PERSPECTIVES

The task of formulating a broadly based perspective on any applied field of knowledge requires at the outset a meaningful conception of the nature and range of subject matter. Yet, as is often the case with highly interdisciplinary subjects, many difficulties beset any attempt to establish a fixed domain for communication theory. For if the approach to human communication is too narrowly conceived the subject may be mistakenly reduced to a trivial concern. On the other hand, if the scope of study is too broadly defined the risk is rather one of extending communication theory to a province that is too nebulous for meaningful study. Clearly, then, there is no universally acceptable way of delimiting the scope of human interaction. Nonetheless, we are reminded by Hymes that the many difficulties entailed in delimiting the scope of human communication do not justify ignoring them. Therefore, what the framework of this book provides are selected theoretical dimensions of study, all independently defined yet closely interrelated, and existing within a larger-based theoretical framework. The dimensions and scope of communication theory will be examined in the three essays included in this section.

In the introductory essay, "On Defining Communication," Thomas R. Nilsen considers some of the obstacles to formulating a useful definition of human communication. After examining several representative definitions from the standpoint of the concept of *intent*, Nilsen provides one working solution by proposing a definition of

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communication based upon the principle of *discriminative response.*

Using the notion of rhetoric as a touchstone, Wayne E. Brockriede in "Dimensions of the Concept of Rhetoric" formulates a multidimensional framework for studying human communication. Each communicative act, as Brockriede insists, is infinitely complex, the unique result of an interplay of what he terms the *interpersonal, situational,* and *attitudinal* dimensions of human interaction. By showing how these constant, on-going dimensions or forces influence one another, Brockriede underscores human communication as an exceedingly intricate activity that involves virtually an infinite number of behavioral processes.

Whereas Brockriede considers the situational and interpersonal dimensions of communication from within a rhetorical perspective, Franklin Fearing in "Toward a Psychological Theory of Human Communication" examines the same variables from a decidedly psychological vantage point. Fearing, like Brockriede, conceives of communication as an act occurring in a matrix of social and individual forces. In Fearing's conception, however, the emphasis shifts from a descriptive perspective to an explanative theory which considers communication as an event occurring in a *situational field.* The theory posits that the individual's tensional states lead to the production of communication (signs and symbols) aimed at achieving a more stable form of social organization.

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ON DEFINING COMMUNICATION

Thomas R. Nilsen

The meaning of the word "communication" is at once both clear and obscure. It is clear enough in conventional usage, but obscure when we seek to determine the limits of its application. To illustrate, if someone talks to another and common understanding results (indicated by mutually satisfactory action), we have no qualms about saying that communication has occurred. If, however, misunderstanding results (indicated by mutually unsatisfactory action), we are uncertain whether we should say that there has been poor, or no, communication. Further, if someone does not talk to another and the latter as a result gains certain impressions of the former, has communication occurred? Would it make any difference whether the first person deliberately did not talk or unintentionally failed to talk? If someone eavesdrops·on a conversation, is he receiving communication? If from the antics of my neighbor's children or from the condition of his house I draw certain conclusions about him, has there been a communication? If I classify a group of objects before me, say, several pieces of lumber, on the basis of certain characteristics, is there communication?

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The problem is familiar. It seems impossible to draw a line between those situations that we conventionally term "communication" and those we do not, short of a purely arbitrary distinction. And the many and varied definitions of "communication" appearing in the literature of various fields of study often appear, at first glance at least, to compound the difficulty.

We who are teaching speech must be concerned about defining communication. Certainly our concept of this process determines to no small degree our approach to speech training, how broadly or narrowly we view our subject, how we relate it to other areas of study. My purpose in this paper is to put the problem of defining "communication" in clearer perspective, thus assisting in the selection of a more consistent and pedagogically helpful concept of communication. To accomplish my purpose, I shall present a number of definitions of "communication" in a two-fold classification and examine the application of these definitions to a series of situations in which human responses and interactions occur. Such classification and application should give us some insights into the problem of definition, into the relationship among existing definitions, and provide us with the perspective necessary to select the most basic, consistent, and useful definition of "communication," and to see its relationship to the process of speech.

I

Definitions of "communication" fall into two broad categories. In one category are those definitions which limit the process of communication to those stimulus-response situations in which one deliberately transmits stimuli to evoke response. In the other category are those definitions that include within the area of communication stimulus-response situations in which there need not be any intention of evoking response in the transmission of the stimuli. The second category obviously overlaps the first.

The definitions below I have grouped into these two categories. In the first group there is no particular sequence; I include the various definitions to provide a broad view of the definitions in this category. In the second group I present the definitions roughly in the order of their inclusiveness.

CATEGORY ONE

Our everyday usage of the word "communication" fits in here. Standard dictionary definitions reflect it. "Communicate" is defined as "To impart, bestow, or convey. . . . To make known; give by way of information. . . . To have intercourse, or to be the means of intercourse; to hold or afford communication; to converse. . . ." "Communication" is defined as "The act or fact of communicat-

ing. . . . Intercourse by words, letters or messages; interchange of thoughts or opinions, by conference or other means; converse; correspondence." [1]

Wilbur Schramm gives what he terms the classical statement of the communication process as ". . . *A communicates B through channel C to D with effect E.* Each of these letters is to some extent an unknown, and the process can be solved for any one of them or any combination." [2] Similarly, Carl Hovland states that communication is ". . . the process by which an individual (the communicator) transmits stimuli (usually verbal symbols) to modify the behavior of other individuals (communicatees)." [3]

Elaborating the process of communication more fully, Mapheus Smith states,

Communication behavior in its simplest reciprocal form is the use of some action by one person, whether or not accompanied by a material object, as a stimulus to another person in such a way that the second person can perceive the experience of the stimulating person. The overt action of the first person plays the role of a symbol whose reference or meaning is the same for the two participants, with the result that common experience is perceived by both participants.[4]

Smith uses the term "communicative behavior" because it focuses attention on the process of interbehavior.

Two other definitions are interesting additions to this category for the distinctions they draw between communication as interaction and other forms of interaction. Charles Morris writes,

The term communication, when widely used, covers any instance of the establishment of a commonage, that is, the making common of some property to a number of things. In this sense a radiator "communicates" its heat to surrounding bodies, and whatever medium serves this process of making common is a means of communication (the air, a road, a telegraph system, a language). For our purposes "*communication*" will be limited to the use of signs to establish a commonage of signification; the establishment of a commonage other than that of signification—whether by signs or other means—will be called *communization*.[5]

Thus, as Morris points out, the anger of one person may make another person angry, and signs may not have established the commonage. This sort of situation

[1] *Webster's New International Dictionary of the English Language* (2d ed.) (Springfield, Massachusetts: G. & C. Merriam Company, 1934), p. 541.

[2] Wilbur Schramm, ed., *Communications in Modern Society: Fifteen Studies of the Mass Media Prepared for the University of Illinois Institution of Communications Research* (Urbana: The University of Illinois Press, 1948), p. 24. (Italics in the original.)

[3] Carl Hovland, "Social Communication." *Proceedings of the American Philosophical Society,* XCII (12 November, 1948), 371.

[4] Mapheus Smith, "Communicative Behavior," *Psychological Review,* LIII (September, 1946), 294.

[5] Charles Morris, *Signs, Language and Behavior* (New York: Prentice-Hall, Inc., 1946), p. 118.

he calls "communization." On the other hand, someone may signify anger, and, without becoming angry himself cause someone else to signify anger. An incident of this type he calls "communication." [6]

George Lundberg puts his definition this way:

We shall use the word communication, then, to designate interaction by means of signs and symbols. The symbols may be gestural, pictorial, plastic, verbal, or any other which operate as stimuli to behavior which would not be evoked by the symbol itself in the absence of special conditionings of the person who responds. Communication is, therefore, a sub-category under interaction, namely, the form of interaction which takes place through symbols.[7]

Lundberg adds that this definition is subject to certain qualifications. It is important to distinguish between ". . . *communication* and mere *contact*, or *interaction* whether on the verbal level or otherwise." [8] "True societal communication consists of temporarily identifying oneself symbolically with the other as regards the particular situation involved in the communication." [9] True communication, he says, is the kind of interaction through signs and symbols that leads to tension reduction or understanding. Similar interaction that leads to increasing tension is also communication, but of a different degree. It involves a different degree of symbolic identification.[10]

In the last two definitions above there is recognition of processes or areas of behavior very closely related to communication—the "communization" of Morris and the "interaction without the use of signs and symbols" of Lundberg—but which, however, they carefully mark off from what is strictly called "communication." The excluded areas of behavior, in the present classification, would be included among the definitions in category two.

CATEGORY   TWO

In this group are the definitions that include as communication situations those situations in which there is no intentional transmission of stimuli to evoke response. Two concepts of communication in this category are suggestive of the Morris and Lundberg definitions, but instead of excluding the closely related areas of behavior they include them as special kinds of communication. Edward Sapir, in defining communication, wrote of "explicit" and "implicit" communication. The former is communication in the conventional sense, the use of lan-

[6] *Loc. cit.*

[7] George Lundberg, *Foundations of Sociology* (New York: The Macmillan Company, 1939), p. 253.

[8] *Ibid.*, p. 283.

[9] *Ibid.*, p. 274.

[10] *Loc. cit.*

guage to establish common understanding among people (a Category One defini-
tion); the latter is the "intuitive interpretation" of the "relatively unconscious
symbolisms of gesture, and the unconscious assimilation of the ideas and behav-
ior of one's culture," [11] (which definition finds its place in Category Two).
Baker Brownell used the terms "direct" and "indirect" communication. The lat-
ter is a ". . . process wherein something converted into symbols is carried over
from one person to another." [12] This is conventional usage (Category One
again). The former, direct communication, is a function of the
". . . identification of people with one another." This is communication without
a symbolic medium; it is an identification of experience.[13]

Theodore Newcomb states that when someone gains certain impressions of
someone else the latter is communicating something to the former. To use his ex-
ample, the man who allows junk to accumulate in his front yard communicates
something to his neighbor whether he knows it or not.[14] An almost identical
point of view is that of Jurgen Ruesch, who states that ". . . as used in our
sense the concept of communication would include all those processes by which
people influence one another." [15] And in slightly different wording, Henry
Lindgren expresses it, "Communication, viewed psychologically, is a process
which is concerned with all situations involving meaning." [16]

Several years earlier Charles H. Cooley had foreshadowed this broad con-
cept of communication:

By communication is here meant the mechanism through which human relations exist and
develop—all the symbols of the mind, together with the means of conveying them through
space and preserving them in time. . . .

There is no sharp line between the means of communication and the rest of the
external world. In a sense all objects and actions are symbols of the mind, and nearly any-
thing may be used as a sign— . . .[17]

Some writers conceive of the term "communication" broadly enough to in-
clude non-human interactions. S. S. Stevens, for instance, gives what he describes

[11] Edward Sapir, "Communication," *Encyclopedia of the Social Sciences* (New York:
The Macmillan Company, 1933), Vol. IV, p. 79.

[12] Baker Brownell, *The Human Community: Its Philosophy and Practice for a Time
of Crisis* (New York: Harper and Brothers, 1950), p. 240.

[13] *Ibid.*, p. 241. Brownell adds that this sort of event may, in less well developed situa-
tions, occur among animals or between people and animals.

[14] Theodore M. Newcomb, *Social Psychology* (New York: The Dryden Press, 1950),
p. 269.

[15] Jurgen Ruesch, "Values, Communication, and Culture," in Jurgen Ruesch and
Gregory Bateson, *Communication: The Social Matrix of Psychiatry* (New York: W. W.
Norton and Company, 1951), pp. 5–6.

[16] Henry C. Lindgren, *The Art of Human Relations* (New York: Hermitage House,
1953), p. 135.

[17] Charles H. Cooley, *Social Organization: A Study of the Larger Mind* (New York:
Charles Scribner's Sons, 1924), p. 61.

as a ". . . broad, operational, and behavioristic" definition of communication. He states:

Communication is the discriminatory response of an organism to a stimulus. . . .

   This definition says that communication occurs when some environmental disturbance (the stimulus) impinges on an organism and the organism does something about it (makes a discriminatory response). If the stimulus is ignored by the organism, there has been no communication. The test is differential reaction of some sort. The message that gets no response is not a communication.[1b]

Stevens adds that his definition includes the clucking of a mother hen that brings her chicks, as well as a treatise on the information theory of communication.

   In Warren Weaver's definition the ultimate step is taken, to include the interaction of machines:

The word *communication* will be used here in a very broad sense to include all of the procedures by which one mind may affect another. . . . In some connection it may be desirable to use a still broader definition of communication, namely, one which would include the procedures by means of which one mechanism (say automatic equipment to track an airplane and to compute its probable future positions) affects another mechanism (say a guided missile chasing this airplane).[19]

   With the above classification of definitions in mind, let us turn to an application of these definitions.

II

   Let us picture an office in which several men are working at their desks. At midmorning the boss emerges from his private office and briefly talks with an employee. Let us assume that he gives the employee instructions to prepare a report, which the latter does, to the complete satisfaction of the boss. We can, without quibbling, say that in this case communication between the employer and the employee has occurred. We can also say that in this case communication has been successful. If the report had not been correct in every detail, because of some misunderstanding of the instructions, we would still say that communication had occurred, though not so successfully.

   Now suppose the boss had stepped into the room, briefly looked around, and then returned to his office without having said a word or made a gesture de-

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[18] S. S. Stevens, "Introduction: A Definition of Communication," *The Journal of the Acoustical Society of America*, XXII (November, 1950), 689.

[19] Claude E. Shannon and Warren Weaver, *The Mathematical Theory of Communication* (Urbana: The University of Illinois Press, 1949), p. 95.

signed to evoke a response. It seems reasonable to suppose that some of the employees would nevertheless respond. They might have wondered, for instance, if the employer were checking to see that everyone was busy. It seems apparent, moreover, that the responses of the employees might have been the same whether the boss had in fact been observing their work or not thinking about them at all. And yet again, if the employees had expected the boss to appear and had he not done so, his nonappearance would undoubtedly have evoked certain responses.

Let us imagine, to carry the hypothetical incident further, that one of the employees is working on a large chart. His desk is inconveniently small for his work; lack of space reduces his efficiency and makes his job appreciably more difficult. The employee might respond by feeling frustrated and angry. He might further begin to consider his small desk a threat to his prestige, and an indication of the small value the company places on his services. Still another employee might be finding his chair uncomfortable, and besides squirming around for an optimum adjustment to it, could well be thinking that the boss feels little concern for the welfare and dignity of his employees.

These commonplace office situations, a moment's reflection will show, correspond to most, if not all, of the communication situations defined in the section above. There was transmission of stimuli to evoke response; there was an interchange of ideas; the use of signs established a commonage of signification; people interacted through the use of signs and symbols; and impressions of certain people—intended or unintended—were evoked in the minds of others. These doubtless were, in Sapir's terms, intuitive interpretations of gesture and unconscious assimilation of office culture. Also there may have been direct communication in Brownell's sense of the identification of people with one another, which perhaps could be illustrated by the common feelings toward the company. All were situations involving meaning. Moreover, we could class all as discriminatory responses to environmental stimuli.

If we apply our definitions by categories, we find that in terms of the definitions in Category One, only the first of the office situations described has the characteristics of a communication situation, that is, the one in which the boss instructed an employee to make a report. In none of the others was there a deliberate use of signs or symbols to influence behavior. All of these situations could, however, with the addition of the element of purpose, involve communication in the sense of Category One. Had the boss when he made his wordless appearance done so intentionally to evoke response, or had he intentionally not appeared when he knew his employees expected him to (the absence of a stimulus object in a certain context can be as meaningful as its presence), the definitions would apply. If the too-small desk and the inadequate chair had been purposely given to the men in question (to let them know, for instance, that they were not so important as they might have felt themselves to be) these would have been communication situations in terms of definitions in Category One.

If we apply Category Two definitions, on the other hand, we find that all the office situations described involve communication. The definitions of Newcomb, Ruesch, Cooley, Lindgren, Stevens, and Weaver would quite plainly make of each of the office incidents a communication situation. The "split" definitions of Sapir and Brownell are more difficult to apply, but it seems apparent that their "implicit" and "explicit" concepts would include those situations that had meaning for the individuals involved although they were not intentionally structured to have such meaning.

III

What insights can we derive from the above definitions, the relationships among them, and their relationships to the situations described? In the first place, the classification itself gives us a perspective on the problem of defining "communication" by revealing various attempts to conceptualize the process. The classification reveals attempts to delineate certain types of interaction as communication to the exclusion of other types; it reveals attempts to include as a special kind of communication certain interactional behavior that does not fit the conventional concept of communication, and further, a disregard of such distinctions and the inclusion of all forms of human interaction, direct or indirect, as communication. And still further, it reveals definitions so broad that certain animal responses, and even mechanical interactions, fall into the category of communication.

Secondly, the importance and value of viewing communication as response become apparent. It is evident from the classification and application of the definitions that in the first category the concept of the process of communication is from the point of view of the transmitter of stimuli, and in the second category, from the point of view of the person responding. Looking at the process of communication from the transmitter's point of view provides the most obvious method of delimiting the area of behavior to be treated as communication, and consequently simplifies the problem of definition. If someone is transmitting stimuli for the purpose of evoking response there is communication; otherwise there is none. This is certainly one basis for definition, but it leaves a large area of behavior—often indistinguishable from "communication" by the responder or an observer—inadequately related to it, and in a sense unaccounted for. Only the transmitter can know whether or not he is transmitting stimuli for the purpose of influencing the behavior of others.

When the process of communication is viewed from the perspective of the person responding, the above problem of what to do with the closely related behavior no longer exists. There seems to be no significant difference in the process

of response whether or not it is to deliberately transmitted stimuli, and therefore no reason to classify the responses on this basis. To use the office examples again, in the non-verbal situations, if the responders had known whether or not the situations were intentionally structured, it might have made a difference in the behavior elicited, but this difference would have been the result of their having perceived the stimulus pattern differently. Had they assumed intentional structure, then whether or not there was in fact intentional structure would have made no difference to their response.

There may appear to be a problem in viewing communication from the point of view of the responder when we proceed from people's influencing each other through words, actions, or man-made artifacts as communication to including as communication the individual's response to some object in the natural environment that human effort has in no way structured. Take, for instance, someone's responses to the moon. Yet, here again, apart from the very basic response of awareness, his reactions, intellectual and emotional, and the meanings he "sees" in the moon are a function of the influence of other minds; he is interacting, though indirectly, with other people.

Thirdly, we are able to select a basic and useful definition of "communication." The logical end result of accepting any of the definitions in Category Two is the acceptance of the broadest of the definitions, that of Stevens, which includes all instances of discriminatory response to environmental stimuli as communication (disregarding, of course, mechanical interaction as communication). As a basic definition this is the most satisfactory. It is inclusive of the other definitions, and it provides a perspective that permits us to see the relationships between the many other proposed definitions of communication.[20] Viewed from the perspective of this definition, the other definitions differ from each other on the basis of the range of response-evoking stimuli included in the communication situation. By the same token, this definition permits us systematically to delineate areas of communicative behavior for purposes of study, while keeping these limited areas of behavior in a consistent relationship to the total area of communicative behavior of which they are a functionally inseparable part. We can delineate these areas for study by delimiting the range of response-evoking stimuli that is to be included in a given communication situation. Thus we might include as communication only those responses to words, objects, or actions deliberately structured to evoke response in a given situation. We might include only responses to written words designed to "communicate" at a particular time. We might include only spoken words and bodily actions, or only spoken words, or spoken words in a face-to-face situation, depending upon what aspect of the human interaction we happen to be primarily interested in.

There can, of course, be no sharp line of demarcation between the responses

[20] In this paper I have arbitrarily limited my discussion to a consideration of communication at the human level.

defined as communicative and those that are not. There is, as Cooley stated, no sharp line between the means of communication and the rest of the external world. Moreover, delimiting the communication situation by limiting the range of response-evoking stimuli included does not cancel the effects of other stimuli. The individual is constantly making differential responses to a wide range of stimulus patterns, environmental and internal, responses which are often inextricably intermingled with the responses to the stimuli that would be, by definition in a given case, included within the area of communicative behavior. The process of limitation suggested here, however, makes possible a systematic approach to the problem of limited definition, and makes us more clearly aware of what we are including and excluding for purposes of study and how these parts are related to each other.[21]

The broad, basic definition adopted here points to the basic nature of communicative behavior. While it may often serve our purpose to consider as communication situations only those in which people are responding to verbal stimuli, or rather, to consider primarily their responses to verbal stimuli, we must recognize the integral relationship between such responses and responses to other stimuli.

The problem of defining "communication" is not unlike that of defining "education." In a sense, all learning experiences are educational (perhaps all experiences beyond reflex action), but to make learning more rapid and profitable we set up certain conditions of learning and in general limit the term "education" to an application to learning under such conditions. But to see what is conventionally termed "education" in the proper perspective we must see it in relationship to the vast number of other experiences of which it is a functionally inseparable part. And so, too, must we see communication, particularly that process of communication we call speech.

[21] What I have written about the process of communication in no way suggests that any one factor in the process of producing, transmitting, or receiving stimuli is more important than another. Within what may be defined in a given case as a "communication situation" we may single out for further analysis the source of the stimuli, the nature of the stimuli transmitted, the method of transmission, the receiver of the stimuli, the responses evoked, or relationships among these factors.

DIMENSIONS OF THE CONCEPT OF RHETORIC

Wayne E. Brockriede

During recent years a state of cold war has existed in the field of speech. Humanists who seek to understand rhetoric primarily through the use of historical scholarship and behavioral scientists who seek to develop a communication theory primarily through empirical description and experimental research have tended to see one another as threatening enemies. Yet members of these factions have the common objective of studying similar phenomena. The student of communication who conceives his study as focusing on pragmatic interaction of people and ideas is concerned with the rhetorical impulse within communication events.[1]

[1] Although my treatment differs from Dean C. Barnlund's excellent analysis in his "Toward a Meaning-Centered Philosophy of Communication," *Journal of Communication*, XII (December 1962), 197–211, the scope of my conception of rhetoric seems similar to the scope of his conception of communication. Gerald R. Miller in his *Speech Communication: A Behavioral Approach* (Indianapolis. Ind., 1966), makes explicit (p. 12) his synonymous usage of the terms rhetoric and speech communication.

The purpose of this essay is to sketch the beginning and to encourage the further development of a system of dimensions for the study of rhetorical communication. Five assumptions implicit in this attempt should be stated explicitly from the outset.

First, the conception of rhetoric broadly as the study of how interpersonal relationships and attitudes are influenced within a situational context assumes the presence of the rhetorical impulse in such diverse acts as a speaker addressing an audience face to face or through mass media, a group of people conferring or conversing, a writer creating a drama or a letter to an editor, or a government or some other institution projecting an image.

Second, the concept of rhetoric must grow empirically from an observation and analysis of contemporary, as well as past, events.[2] The dimensions should be selected, developed, structured, and continuously revised to help explain and evaluate particular rhetorical acts.

Third, although the theorist, critic, or practitioner may focus his attention on a rhetorical act, such an act must be viewed as occurring within a matrix of interrelated contexts, campaigns, and processes.

Fourth, the rubrics of a rhetorical act are best viewed as dimensional, each reflecting a wide range of possible descriptions and not as expressing dichotomies.

Fifth, the dimensions of rhetoric are interrelational: Each dimension bears a relationship to every other dimension.

This essay, therefore, represents an attempt to sketch a contemporary concept of interrelated interpersonal, attitudinal, and situational dimensions of a broadly conceived rhetorical act.

1

Traditional rhetoric places much less emphasis on interpersonal relationships than does the model presented in this paper. Even the concept of *ethos* frequently has been conceived as personal proof functioning rationalistically as a message variable.[3]

What are here developed as interpersonal dimensions may indeed function in an instrumental way, having some influence on a rhetorical act which aims primarily at attitudinal influence or situational appropriateness. But interpersonal dimensions themselves often represent the principal goals; and the estab-

[2] An argument which supports this claim is developed in my essay "Toward a Contemporary Aristotelian Theory of Rhetoric," *QJS*, LII (February 1966), 35–37.

[3] For example, in Lester Thonssen and A. Craig Baird's *Speech Criticism* (New York, 1948), the chapter on *ethos* (pp. 383–391) is subtitled "ethical proof in discourse."

lishment, change, or reinforcement of such interpersonal relationships as liking, power, and distance may exercise a controlling influence on the other dimensions.

LIKING. This interpersonal dimension poses the question: how attracted to one another are the people who participate in a rhetorical act? Liking differs qualitatively and may refer to such continua as spiritual adoration—hate, sexual attraction—repulsion, friendship—enmity, and compatibility—incompatibility. In a dyadic act the feelings may or may not be mutual. When many people are involved—as in hearing a public address, participating in a discussion, or reading a best-seller, a single relationship may be characteristic—as when an audience becomes polarized, or relationships may vary—as when some discussants feel affection for a leader whereas others are repelled. Liking also differs in degree of intensity and in degree of susceptibility to change.

The change or reinforcement of the liking dimension may function as the primary purpose of a rhetorical act; courtship, for example, aims principally at affecting this relationship. Or increasing, maintaining, or decreasing the degree people like one another may be a by-product of a situation which has other chief aims. Or the liking relationship, though it remains essentially unchanged during a rhetorical act, may have a profound influence on whether other dimensions vary, as well as on how they vary.[4]

POWER. Power may be defined as the capacity to exert interpersonal influence. Power may be the ultimate purpose or function, as in a power struggle, or it may be a by-product of or an influence on the controlling dimensions. The power dimension includes two primary variables.

First, what are the kinds of power? One is the influence a person has because others like him. The word *charisma* denotes this kind of power when it reaches a great magnitude. But personal magnetism exists also in lesser degrees. The power of personal attractiveness represents a kind of intersection of liking and power. A second type of power stems from position or role in the social system. By having control over the assignment of sanctions, the allocation of rewards and punishments in a social system, a man merely by virtue of his office or role may be powerful. A third type is the control over the communication channels and other elements of the rhetorical situation. This situational power corresponds to what some people call the gatekeeper function. A fourth kind of power is an influence over the sources of information, the norms and attitudes, and the

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[4] Hugh D. Duncan stresses this dimension in his *Communication and Social Order* (New York, 1962) when he says (p. 170) that "the study of *how men court each other* . . . will tell us much about the function of rhetoric in society." See also Kenneth Burke, *Rhetoric of Motives* in *A Grammar of Motives and a Rhetoric of Motives* (Cleveland, 1962), pp. 732–736. I make no attempt in this essay to catalogue the status of knowledge or to supply bibliographies concerning each of the dimensions discussed. I shall suggest, however, a source or two which will develop further each of the dimensions considered in this essay.

ideology. Such an influence seems to depend on the extent to which other people trust one's ideational competence generally and his special expertise on matters relevant to the rhetorical act, on their perceptions of his general willingness to expresss himself honestly and accurately and of his special candor on the particular relevant topics, and on their feelings of confidence in their abilities to predict accurately the meaning and significance attached to his statements and actions.[5] Finally, one exercises indirectly a degree of power by having access to and influence on other people who can exercise the other kinds of power more directly. So a first general variable of the power dimension is the degree with which people participating in a rhetorical act can manifest these kinds of power.

A second variable is power structure. Knowing how much power of what kind each rhetorical participant has may be less immediately relevant than knowing the relationship among the power statuses of the people involved. That is, power is relative rather than absolute. The significance of the power of a writer, for example, regardless of the amount or kind he may possess, depends on how much power he has relative to that of his readers. Two questions especially are important in an analysis of the power structure. How disparate are the power positions of the various participants of an act, and does the act function to increase, maintain, or decrease the disparity? How rigid or flexible is the structure, and does the rhetorical act function to increase, maintain, or decrease the stability? [6]

DISTANCE.   The concept of distance is related to the other interpersonal dimensions. One generally feels "closer" to those persons he likes and "farther" from those he dislikes, but the greater the power disparity the greater the distance. Like all other dimensions, the establishment of an appropriate distance (whether decreasing, maintaining, or increasing it) may be a rhetorical act's primary function, an incidental outcome, or an influencing factor.

Two kinds of distance make up this dimension. One is an interpersonal distance between each two participants in a rhetorical act. The other is a social distance which exists within the structure of the group or groups within or related

[5] Kenneth Andersen and Theodore Clevenger, Jr., provide an excellent synthesis of information on this kind of power in "A Summary of Experimental Research in Ethos," *Speech Monographs*, XXX (June 1963), 59–78.

[6] This dimension seems to have been ignored in the study of many rhetorical situations. It is only implied, partially, for example, in the public address doctrine of *ethos*. During recent years, however, under the headings of leadership and power structure, many small group specialists have emphasized it. See, for example, Dorwin Cartwright and Alvin Zander, *Group Dynamics: Research and Theory*, 2nd ed. (Evanston, Ill., 1960), pp. 487–809. Among a number of useful works in the field of political sociology which are relevant to an understanding of the function of power in rhetorical acts, see *Class, Status, and Power*, ed. Reinhard Bendix and Seymour Martin Lipset, 2nd ed. (New York, 1966), pp. 201–352.

to the rhetorical act—such groups as audiences, committees, organizations, socie-
ties, and cultures. Although interpersonal and group distance are related closely
and tend generally to co-vary, they are discrete variables in that two persons in a
discussion group, for example, may move more closely together while the group
structure is in the process of disintegrating.[7]

Several questions about the role of interpersonal and group distance in rhe-
torical situations seem important. How much distance (of each type) is optimal
in achieving certain kinds of interpersonal, attitudinal, and situational rhetorical
functions? What conditions of the other dimensions are most likely to increase,
maintain, or decrease the distance (of each type)?

2

Controversial ideas which involve a choice among competing judgments, at-
titudes, and actions form a necessary part of any rhetorical act. Very often, al-
though not always, such a choice is the primary operation, and the various inter-
personal and situational dimensions merely create the environment in which the
choice is made and influence how the choice is made. Traditionally, rhetoric
seems rather consistently to have made this sort of assumption. The principal
function of some rhetorical acts is interpersonal interaction or situational ap-
propriateness, however, and the influence on attitudes in the making of choices is
secondary. Attitude may be defined as the predisposition for preferential re-
sponse to a situation. Two kinds of attitudes have rhetorical significance: atti-
tudes toward the central idea in a choice-making situation and the ideological
structure of other related attitudes and beliefs.

CENTRAL IDEA.   Several features of attitudes toward the central idea of a
rhetorical situation require study.

First, although attitudes customarily have been considered as a point on a
scale, this view is inadequate. As Carolyn Sherif, Muzafer Sherif, and Roger E.
Nebergall have pointed out, a person's attitude may be described more accurately

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[7] One of the shortcomings of the concept of interpersonal distance is that the term is
not readily operationalized into specifiable behaviors. Consciously or unconsciously, however,
people seem to have a sense of closeness or distance from others; such a feeling can influence
rhetorical interaction. The philosophical basis for Kenneth Burke's rhetoric is the view that
men are fundamentally divided. His concepts of identification and consubstantiality suggest
that one of rhetoric's functions is to reduce man's interpersonal distance from man. See, for
example, Burke, pp. 543–51. Edward T. Tall treats distance literally as a variable in com-
munication situations in his *Silent Language* (Garden City, N. Y., 1959), pp. 187–209. The
concept of social distance is implied in such terms in small group research as group cohesive-
ness, primary groups, and reference groups.

by placing various alternative positions on a controversy within three lati-
tudes—of acceptance, of rejection, and of non-commitment.[8] On the policy of the
United States toward Vietnam, for example, a person may have one favored posi-
tion but place other positions within his latitude of acceptance; such additional
positions are tolerable. He may have one position that he rejects more strongly
than any other but place other positions within his latitude of rejection. Finally,
because he lacks information, interest, or decisiveness, he may place other posi-
tions within his latitude of non-commitment. To understand or predict the attitu-
dinal interaction in a rhetorical situation one must know whether its central idea
falls within the participant's latitude of acceptance, rejection, or non-commit-
ment.

Second, the degree of interest and the intensity of feeling with which the
central idea confronted in a rhetorical act occupies a place in whatever latitude
will influence potentially all other dimensions of that act.

Third, the way the various latitudes are structured is an influential variable.
Sherif, Sherif, and Nebergall identify one such structure which they term ego-
involvement. A person who is ego-involved in a given attitude tends to perceive
relatively few discrete alternative positions, to have a narrow latitude of accept-
ance—sometimes accepting only one position, to have a broad latitude of rejec-
tion—lumping most positions as similarly intolerable, and to have little or no lat-
itude of non-commitment.[9] The ego-involved hawk, for example, may accept only
a strong determination to achieve a military victory, assimilating all positions
close to that one; and he may reject all other stands, seeing little difference be-
tween unilateral withdrawal and attempts to negotiate that necessitate any gen-
uine concessions to the adversary, and labeling anything less than total victory as
appeasement.

Fourth, a person's persuasibility on the central idea of a rhetorical act is a
relevant variable. How likely is a person to respond positively to attempts to
change his attitude? This question suggests the superiority of the Sherif, Sherif,
and Nebergall analysis. The question is not the simple one of how likely is a per-
son to move from "yes" to "no" or from favoring a negotiated settlement in Viet-
nam which does not involve the possibility of a coalition government in South
Vietnam to one which does. It is the far more complex question of whether posi-
tions which are now assigned to one latitude can be moved to another one. This
concept recognizes, for example, that to move a person from a position of rejec-
tion to one of non-commitment is significant persuasion. A person's persuasibil-
ity is related, of course, to the nature, intensity, and structure of his attitude.[10]

[8] *Attitude and Attitude Change: The Social Judgment-Involvement Approach* (Phila-
delphia, 1965), pp. 18–26.

[9] *Ibid.,* p. 233.

[10] In addition, an individual's personality may be one of the determinants of his
persuasibility on controversial propositions. See Irving L. Janis, Carl I. Hovland, *et al.*,

An ego-involved person who feels strongly about an idea is less likely to change his attitude than one who is less ego-involved or less intense.

What the preceding discussion suggests is that the nature, intensity, structure, or persuasibility of the attitude of any participant toward the central idea in a rhetorical transaction will influence the other dimensions and be influenced by them. In addition, the relationship of the attitudes of each participant to those of others in the situation will influence their interaction together. The issue here can be focused in a single question: how similar are the people in a rhetorical act with respect to the nature, intensity, structure, and changeability of their attitudes toward the idea under focus in the rhetorical act? Or, to put the question in a slightly different way: to what extent can people identify with the attitudes of one another? [11]

IDEOLOGY.   An attitude does not exist in a vacuum. One idea does not occur by itself. Rather, attitudes have homes in ideologies. The ideologies evoked in a rhetorical act influence, and may sometimes dominate, the other dimensions.

Several ideological structures may be identified. Attitudes may relate to other attitudes, to systems of values and norms, to ethical codes, and to philosophic presuppositions about the nature of man, the nature of reality, the nature of language, and the nature of knowledge. About each of these contexts two questions may be raised: What is the nature of the ideological structures of each participant in the act? How similar or different are the ideologies of the various participants?

The central idea of any rhetorical transaction evokes not only attitudes toward that idea but attitudes toward related ideas. In recent years several theories and approaches have developed: balance theory, the theory of cognitive dissonance, the congruity hypothesis, and the social judgment approach.[12] Although these formulations differ and the differences are argued heatedly, one principle seems accepted by most attitude theorists: man has an urge to think himself consistent, to try to achieve homeostasis within his system of attitudes.

Although relatively few persons work out a careful formulation of an ideology which consciously monitors various attitudes, each person very likely has an implicit ideology which unconsciously affects the development of any attitude in the system. Anyone attempting to change one attitude of a person, therefore, will profit from the admittedly difficult task of identifying that person's other atti-

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Personality and Persuasibility (New Haven, Conn., 1959), and Milton Rokeach, *The Open and Closed Mind* (New York, 1960).

[11] Kenneth Burke's concept of identification seems to relate to the attitude dimension as well as to the dimension of interpersonal distance.

[12] See Fritz Heider, "Attitudes and Cognitive Organizations," *Journal of Psychology*, XVL (April 1946), 107–114; Leon Festinger, *A Theory of Cognitive Dissonance* (Evanston, Ill., 1958) ; Charles E. Osgood, Percy Tannenbaum, and George Suci, *The Measurement of Meaning* (Urbana, Ill., 1957) ; and Sherif, Sherif, and Nebergall.

tudes and of considering how they may facilitate or retard such an attempt and how the target-attitude will, if changed, affect other attitudes. In addition, to understand the rhetorical interaction on some central idea one must also consider how similar or different one person's attitudes toward related ideas are to those of other people in the rhetorical act.

A second ideological variable is the system of values and norms subscribed to by the people in a rhetorical act. Just as a person's attitudes relate to his other attitudes, they relate also to more fundamental principles which he values. Whereas the first relationship may be viewed as a sort of part-to-part analogical inference, the second is a part-to-whole (or whole-to-part) inference. General values both evolve from many particular attitudes, and they also structure new experience in the development of new attitudes toward new situations.[13]

One of the most important sources of each person's fundamental values is his membership in small groups, organizations, societies, and cultures. The argument can be made that all values can be traced generally to a social origin, but some values especially can be associated closely with membership in a particular reference group—whether small group, organization, society, or culture. Such shared values are termed norms. When a rhetorical situation involves the actual or implied presence of such groups, the norms of those groups predictably are going to function as an ideology which will tend to set limits for attitudes of group members.[14]

A third kind of ideology is the ethical variable which raises two questions: What personal morality or public ethic guides the interaction of attitudes? Is the code of conduct acceptable to others who participate in the rhetorical act? A transaction of ideas viewed as unethical by someone with whom a person tries to interact will have adverse effects on many of the other dimensions.[15]

A fourth ideological variable consists of a person's philosophic presuppositions about the nature of man, the nature of reality, the nature of language, and the nature of knowledge. This variable probably functions relatively rarely as the primary goal of a rhetorical act, perhaps only when philosophers engage in dialogue, but it establishes a frame of reference within which attitudes interact. Is a

[13] In their essay "The American Value System: Premises for Persuasion," *Western Speech*, XXVI (Spring 1962), 83–91, Edward D. Steele and W. Charles Redding state, "Values, as they exist psychologically in the mind of the audience, have been generalized from the total experience of the culture and 'internalized' into the individual personalities of the listeners as guides to the right way to believe or act" (p. 84). Karl R. Wallace argues that general value premises function as the *substance* of rhetoric—as good reasons which support propositions or value judgments. See "The Substance of Rhetoric: Good Reasons," *QJS*, XLIX (October 1963), 239–249.

[14] See A. Paul Hare, *Handbook for Small Research* (New York, 1962), pp. 23–61.

[15] Edward Rogge, in his "Evaluating the Ethics of a Speaker in a Democracy," *QJS*, XLV (December 1959), 419–425, suggests that the standards used to evaluate a speaker's ethics be those established by the audience and the society of which it is a part.

man an object to be manipulated or a decision-maker in the process of making radical choices? To what extent does he behave rationally? To what extent is his rhetorical behavior determined for him and to what extent does he exercise free will? Does one take an Aristotelian, a Platonic, or a phenomenalistic stance on the question of the nature of reality? How does man acquire knowledge? To what extent does he come to know through *a priori* intellection, through revelation, through intuition, through memory, through empirical observation, through existential experience, or through scientific analysis? [16] How each person in a rhetorical act answers these questions, and the degree to which the various answers are similar, will influence how attitudes interact.

3

A rhetorical act occurs only within a situation, and the nature of that act is influenced profoundly by the nature of the encompassing situation. Furthermore, on certain ceremonial occasions situational dimensions dominate the act. A speaker's function in a funeral oration, for example, may be merely to meet the expectations of the occasion. Six situational dimensions form a part of the conceptual framework advanced in this essay: format, channels, people, functions, method, and contexts.

FORMAT. The essential concern of this dimension is how procedures, norms, and conventions operate to determine who speaks and who listens.

Formats fall into two general types which anchor the ends of the dimension. At one extreme is a polarized situation in which one person functions as speaker or writer and others function as listeners or readers. At the other extreme is a type of conference situation in which the functions of the various participants rotate freely between speaking and listening.

Formats vary with respect to the degree of flexibility permitted rhetorical participants. In some situations, for example in written and electronic discourse, a rhetorician has little opportunity to revise his original plans within the act, although he may utilize feedback in designing subsequent acts in a campaign. In other situations a rhetorician has maximum opportunity to observe the reactions of others and to make appropriate decisions accordingly.[17]

CHANNELS. The role of channels in a rhetorical act is manifested in three

[16] The importance of the philosophic dimension of rhetoric is well argued by Otis M. Walter in "On Views of Rhetoric, Whether Conservative or Progressive," *QJS*, XLIX (December 1963), 367–382.

[17] See David K. Berlo, *The Process of Communication* (New York, 1960), pp. 111–116. Ironically, in public address, a format which offers considerable opportunity for communicative flexibility, the role of feedback has been analyzed very little.

variables. First, is the communication conveyed verbally, nonverbally, or through a mixture of the two modes? Radio speaking and written messages are instances of the verbal channel; a silent vigil and pictures employ the nonverbal channel; and face-to-face speaking, television, and books which feature graphic materials illustrate the mixed mode.[18]

Second, if language is employed, is it in oral or written form? Although the distinction between these two channels needs no clarification,[19] their modes of transmission require analysis. Traditional rhetoric has long studied delivery as one of the canons. Although students of written composition have paid far less attention to the study of transmitting messages, such features as the selection of paper, binding, cryptology, and the like may influence the interaction between writer and reader more than the persons playing either role recognize. Delivery, whether in oral or written channel, illustrates well the primary idea of this essay: that each dimension relates to every other dimension. Delivery will influence and be influenced by the interpersonal dimensions of liking, power, and distance; by the attitudes toward the central idea and toward those related to it; and by the other situational dimensions of format, people, functions, method, and contexts.

Third, is the rhetoric transmitted directly or indirectly? A direct channel is a system of communication in which one person relates to someone else without the interference or aid of a third person or a mechanical device. The oral interpretation act, the speaker who reaches the newspaper reader via a reporter, the tape recording, television, and the two-step flow of communication all illustrate the indirect channel.[20] But indirectness admits of degrees. Messages may be transmitted through only one intermediary person or agency, or they may follow a circuitous track, as in a typical rumor, between its originator and its ultimate, and perhaps indefinite, destination.[21]

PEOPLE.   How rhetorical situations are populated forms six variables. One concerns the number of interacting people. Are they few or many? [22]

[18] Marshall McLuhan's *The Medium is the Massage* (New York, 1967) is a notable attempt to make the nonverbal code as important in a book as the verbal.

[19] Joseph A. DeVito's study of "Comprehension Factors in Oral and Written Discourse of Skilled Communicators," *Speech Monographs*, XXXII (June 1965), 124–128, concluded that written discourse involved a more difficult vocabulary, simpler sentences, and a greater density of ideas than did oral discourse.

[20] The two-step flow of communication and the concept of opinion leadership has considerable applicability to rhetoric. See Elihu Katz and Paul F. Lazarsfeld, *Personal Influence* (Glencoe, Ill., 1955) and Elihu Katz, "The Two-Step Flow of Communication: An Up-to-Date Report on an Hypothesis," *Public Opinion Quarterly*, XXI (Spring 1957), 61–78.

[21] The classic study of rumor is Gordon W. Allport and Leo Postman, *Psychology of Rumor* (New York, 1947).

[22] I am inclined to include the intrapersonal communication of self-address within the scope of rhetoric. An individual's roles may interact intrapersonally and attitudinally in a variety of situational contexts in ways closely analogous to the interpersonal and attitudinal interaction of two or more persons. For support of this position, see Barnlund, 199–201, and Burke, pp. 561–563.

A second variable is the number of groups which function in the situation, whether as audiences or conferences. The range is from one to many. A speaker may address one particular audience or many audiences, either simultaneously or consecutively. A person may participate in a conference which operates virtually as a self-contained unit or in a conference involving multiple groups.

A third variable has to do with the degree to which the people are organized. The range is from a virtual absence of organization to the status of a highly structured and cohesive reference group.

A fourth variable, closely related to the third, involves the degree of homogeneity among the participating people. They may exhibit a high degree of homogeneity, they may be similar on some and different on other properties, or they may differ so much as to constitute essentially different groups even though they participate in the same situation.[23]

Fifth, participants in a rhetorical situation may vary widely in their degree of awareness of their roles and in their degree of involvement in the situation.

Sixth, those who people a rhetorical situation engage in a range of relationships to that situation. One, some, many, or all of the participants may regard themselves or be regarded by others as depersonalized stimulus objects; as members or agents of a culture, institution, or group; as performing a role; as projecting an image; as manifesting a set of properties; or as selves with radical choices to make or commitments to uphold.

FUNCTIONS.   The functions of a rhetorical situation may be viewed from a general perspective or along interpersonal and attitudinal dimensions.

Some questions of situational function seem to apply both to the interpersonal and to the attitudinal aspects of a rhetorical act. To what extent are interpersonal relationships and/or attitudes to be reinforced or changed? What degrees of intensity of reinforcement or change does the situation call for? If change is to function, in what direction?

Other questions relate directly to the interpersonal dimension. Are people trying primarily to relate, identify, disengage, or in other ways to interact with others in the situation, or are they trying to express their "selves" conjointly? Are they trying to court, please, satisfy, tolerate, dissatisfy, or derogate one another? Are they trying to change or reinforce the power disparity or power structure of the situation? Are they trying to increase, maintain, or decrease social or interpersonal distance? Is group maintenance or group cohesiveness a relevant situational function?

Still other questions relate directly to three kinds of attitude influence. First, a person may present a message with a designative function—to present information, describe, define, amplify, clarify, make ambiguous, obfuscate, review, or synthesize ideas. Second, someone may present a message with an evaluative

[23] The effect of a group's homogeneity and receptivity on the integration and polarization of an audience is admirably discussed in Charles H. Woolbert's pioneer monograph "The Audience," *Psychological Monographs*, XXI, No. 92 (June 1916), 37–54.

function—to praise, make commentary, hedge, criticize, or blame some person, object, situation, judgment, or policy. Third, someone may present a message with an advocative function—to solve a problem, create indecision, reinforce a present choice, foster delay, choose a change alternative, resolve a conflict, propose a compromise, or stimulate action.

The functions of rhetorical situations appear far more complex than implied by the traditional categories of inform, entertain, and persuade.

METHOD.   Any situational function is manifested instrumentally through a number of message variables. These constitute the methodological dimension of the rhetorical act. Method is less often than other dimensions the ultimate function of the act; typically it plays the instrumental role of facilitating whatever dimension is primary.

Method includes the materials presented, the form in which they are structured, and the style in which materials and form are communicated.

Three questions about the material to be presented seem important. How much data should be presented? What kinds of data should be employed? From what sources should they be derived? These questions, of course, have no simple answers universally applicable.

The form variable may be analyzed in two ways. A distinction can be made between a sort of form-in-the-large which permeates the rhetorical method and a more microscopic set of structures which develop. The rhetorical act may be transacted through some conventional medium like an essay, a play, or a speech. A rhetorician may fulfill expectations by using identifiable forms in typical ways, or he may create new forms or employ old forms in new ways. Whether forms are appropriately new or old and whether their development is appropriately conventional or eccentric, of course, depends on the experience and expectations of the other people in the rhetorical act. The method may represent a straightforward management of materials to develop a central idea directly, or reflect an indirect ordering—for example, through the use of irony.[24] How prominent the form-in-the-large is to be is an important issue. Should the form become clearly evident in the discourse, or should it fulfill its function unobtrusively and not call any special attention to itself?

The form variable may also be viewed microscopically. This level of analysis includes a consideration of the logical connection between the material presented and the ideas advanced—which calls for the student of rhetoric to understand the logic of rhetorical interaction and the modes of reasoning appropriate to such interaction.[25] It includes a recognition of the structure which joins the ideas ad-

[24] For an excellent analysis of rhetorical irony, see Allan B. Karstetter, "Toward a Theory of Rhetorical Irony," *Speech Monographs*, XXXI (June 1964), 162–178.

[25] If one accepts the central idea of this essay that rhetoric is a system of interrelated dimensions, he must conclude that a rhetorical logic must accommodate the function of dimensions other than the one concerned with formal relationships among propositions.

vanced into a pattern which amplifies or supports the central idea—which calls
for an understanding of the patterns of expository and argumentative discourse,
the analysis of a controversy into its issues, and the methods of problem-solving
and negotiation.[26]

Specific formal structures may be recognizable immediately to others in the
act and utilized in predictable ways, or they may be new and less obvious. Fur-
thermore, the two levels of form in a discourse, the macroscopic and the micro-
scopic, may function harmoniously toward the same end or constitute incongruity.
Form, whether large or small, may be designed to facilitate information transfer
or to disrupt it; to create a relatively narrow range of meanings and attitudinal
responses or to maximize ambiguity; to present an optimal amount of material
efficiently or to aim at redundancy; to achieve identification or alienation; to
reinforce meanings and attitudes or to change them; and to increase or decrease
the intensity of feelings toward the ideas.

Style, like form, may be viewed macroscopically or microscopically. Rhetori-
cal style may be looked at from the point of view of broad symbolic strategy, a
style-in-the-large. I take this concern to be behind much of the writing of Ken-
neth Burke.[27] Or it may be analyzed by looking at smaller units of analysis—at
the level of the phoneme, word, sentence, or paragraph. Perhaps the writing of
modern linguists may provide better ways of analyzing style microscopically than
rhetoricians have followed traditionally.[28]

Many of the questions raised about form appear to apply also to style.
Whether looked at large or small, style, too, provokes such issues as efficiency of
information transfer, clarity *vs.* ambiguity, conciseness *vs.* redundancy, confi-
dence *vs.* uncertainty, and identification *vs.* alienation. The issues can be re-
solved only by studying the particular interaction of the other dimensions in
each unique rhetorical act.

CONTEXTS.   The contexts of time and place may alter in various ways how
other dimensions function in the act. In this regard context is typical of situa-

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Irrelevant to rhetorical analysis is any logical system which assumes that man is only ra-
tional and that men do not vary, that ideas can be divorced from their affective content and
from their ideological contexts, and that the only situation is that of the logician talking to
the logician.

[26] Rhetoricians have tended to treat these various organizational patterns, like logic,
as invariant structures, without due regard for the totality of the rhetorical situation–its
people, its functions, and its contexts.

[27] Burke, for example, says (p. 567) that rhetoric "is rooted in an essential function of
language itself, . . . the use of language as a symbolic means of inducing cooperation in
beings that by nature respond to symbols." For Burke, rhetorical analysis is an attempt to
unearth the essential linguistic strategies of the rhetorical agent.

[28] In "A Linguistic Analysis of Oral and Written Style," *QJS*, XLVIII (December
1962), 419–422, Jane Blankenship applied the system of analysis which Charles C. Fries
described in his book *The Structure of English* (New York, 1952).

tional dimensions. The substance of a rhetorical act is rarely located in the situation: it more characteristically focuses on the interpersonal and attitudinal categories. Aspects of the situation, including context, although not fundamental or ultimate, however, can alter decisively the other categories and hence change the substance of the act.

In addition, time functions in another way. Each rhetorical act has some larger setting and fits into one or more on-going processes.[29] For example, a novel may be a part of a movement or of several movements, a representation of an ideology or several ideologies, a moment in the career of the writer, a specimen of some formal or stylistic tendency, a phase in some long-term interpersonal relationship with a set of readers, *et cetera*. Several questions may suggest some of the ways a rhetorical act may relate to its contexts. Does an act occur relatively early or relatively late in one or more processes? To what extent is the act congruous with its larger framework? Does the act play one role in one context and a different, and perhaps conflicting, role in another?

4

Important to the student of rhetoric is the question of points of view. A rhetorical act will be perceived quite differently by each person who participates in it, and still differently by each person who observes and criticizes it from the "the outside." Here, as elsewhere, "meanings are in people," not in discourses. Students of rhetoric must try to determine how the various participants and observers have perceived the dimensions of the act and to discover the extent to which such perceptions differ. The points of view of the relevant people become part of an important dimension of the act.

The consideration of point of view may have different implications for theorists, as compared with participants and critics. The theorist tends to be interested in generalizations at the highest level of abstraction he can achieve, whereas participants and critics tend to be interested in making decisions or judgments about one very particular and unique act.

Perhaps the most important single characteristic of rhetoric is that it is a matrix of complex and interrelated variables of the kind discussed in this paper. The theorist cannot meaningfully pluck from the system any single variable and hope to understand it apart from the others. How can one understand style, for example, without knowing how it interrelates with power structure, with distance, with attitudes and ideologies, with the demands of format and context—in short,

[29] Two recent books which display a contextual orientation to rhetoric are Wallace Fotheringham, *Perspectives on Persuasion* (Boston, 1966) and Huber W. Ellingsworth and Theodore Clevenger, Jr., *Speech and Social Action* (Englewood Cliffs. N. J., 1967).

with every other dimension of the act? Gross generalizations about stylistic char-acteristics which ignore the assumption that style functions very differently when placed in different combinations with the other variables simply will not do. Un-fortunately for the prognosis of theoretical advances in rhetoric, the combina-tions and permutations of the alternatives afforded by the various dimensions are so many as to approach infinity. But methods will have to be developed to pursue the sort of interrelational kind of analysis which an adequate theory of rhetoric requires.[30]

The practitioner may use such an interrelational analysis before, during, and after a transaction as a guide to the decisions he must make to give himself the best chance of interacting with others as he wishes.

The critic may profitably identify the single most compelling dimension of a rhetorical act under consideration and then investigate how that dimension in-terrelates with others which appear to be relevant. For example, a critic studying Nikita Khrushchev's interaction with the American public during his 1959 visit to this country might focus primary attention on Khrushchev's reduction of inter-personal distance between himself and his hosts in order to see how his distance-reducing rhetoric related to new American images of Khrushchev personally along liking and power dimensions; to his attempts to make attitudes and ideolo-gies consubstantial; and to his use of various rhetorical situations for these func-tions. If a critic accepts the fundamental premise that each rhetorical act or pro-cess is unique, that dimensions interrelate in a way to create a unity never achieved in the past or in the future, then he commits himself to a search for a new way to select, structure, and weigh dimensions for each new act he criticizes.

My hope is that the dimensions described in this essay may provide a frame-work for theoretical development, practical decision-making, and critical analysis.

[30] Warren Weaver has argued that science must "make a third great advance which must be even greater than the nineteenth-century conquest of problems of simplicity or the twentieth-century victory over problems of disorganized complexity. Science must, over the next fifty years, learn to deal with these problems of organized complexity." See "Science and Complexity," in *The Scientist Speaks*, ed. Warren Weaver (New York, 1945), p. 7. Implicit in my essay is the belief that rhetoric represents a problem of "organized com-plexity."

TOWARD A PSYCHOLOGICAL THEORY OF HUMAN COMMUNICATION

Franklin Fearing

The tremendous significance of communication in human affairs is briefly and arrestingly characterized by a nonpsychologist, Kenneth Burke, when at the end of a penetrating discussion of these problems (9) he says ". . . there is no place for purely human boasts of grandeur, or for forgetting that men build their cultures by huddling together, nervously loquacious, at the edge of an abyss."

It is the purpose of the present paper to present a broad conceptual framework within which the how and why of human loquacity (and related processes) may be considered. The increasing amount of published research on human communicative behavior has made the lack of theoretical integration noticeable. In recent volumes (8, 19, 36) this deficiency has been noted or implied, especially by Hovland (17) and Bryson (8).[1]

[1] This is not to say that there have been no attempts to formulate communications theory. In addition to the important formulations of Lasswell (25), Mead (29), and Burke (9, 10), the recent papers by Hovland (18), Pronko (34) and Smith (38, 39) contain theoretical discussions.

In the present discussion communicative behavior is placed in the context of the current formulations [2] regarding cognitive-perceptual processes conceived as dynamically related to the need-value systems of individuals. Broadly stated, these conceptualizations assert that these systems, which are central in the personality structure of the individual, interacting with the environment, result in instabilities and disequilibriums which are coordinated with an increase in tension in the individual, and that cognitive-perceptual processes structure the environment in a specific manner so as to reduce tension.

Communicative behavior is a specific form of molar behavior which occurs in a situation or field possessing specified properties, the parts of which are in interdependent relationships with each other. A theory of such behavior is concerned with forces, psychological, social, and physical, which determine the course of this behavior and its outcomes in relation to the culture in which it occurs. Such a theory should formulate hypothetical constructs and present a terminology with appropriate definitions in the following four interrelated areas: (*a*) the forces which determine the *effects* of communication, that is, constructs regarding individuals designated *interpreters*; (*b*) the forces which determine the *production* of communications, that is, constructs about *communicators*; (*c*) the nature of communications *content* considered as a stimulus field; (*d*) the characteristics of the *situation* or *field* in which communication occurs.

All the practical and theoretical problems of communications research lie in these four areas. It is essential to the formulations in the present paper that the behavior events in these areas be regarded as *dynamically interrelated*. An important implication of this assumption is that any change occurring in any subregion will have effects in all other regions.

DEFINITIONS OF BASIC TERMS

Certain terms referring to regions of the communications field are used throughout the present discussion. Their definitions follow.

COMMUNICATOR. A communicator is a person (or persons) who produces or controls the production of a body of sign-symbol material with the intent (this term is discussed later) of cognitively structuring the field (or fields) of specific interpreters who are assumed by the communicator to have specific needs and demands. They may or may not be physically present, but are always part of the psychological field of the communicator. The communicator reacts or is capable of reacting to the body of produced material in the same manner in which he anticipates the interpreters will react. There is a special category of communicators who do not originally produce the sign-symbol material, but who, within certain

[2] For example, Bruner and Postman (6, 33), Frenkel-Brunswik (15), and many others.

limits, are able to control or manipulate its subsequent presentation. These we shall call pseudo-communicators.

INTERPRETER.   An interpreter is one who perceives (cognitively structures) a specific body of sign-symbol material produced by specific communicators as a stimulus field in terms of his existing patterns of needs, expectancies, and demands. In perceiving this stimulus field the interpreter implicitly or explicitly identifies its artifactual character and structures its source. The definitions of this structurization vary from a vague "they say" to a definitive identification of the communicator. In any event, part of the stimulus field for the interpreter is the personal agency in its production. The objective truth of these assumptions by the interpreters is not involved.[3]

COMMUNICATIONS CONTENT.   Communications content is an organized stimulus field consisting primarily of signs and symbols produced by a communicator and perceived through single or multisensory channels. It must be susceptible to similar structurizations by both communicator and interpreter. Structurization of the stimulus field may be either simple or complex and in the spatial or temporal dimensions or both. Temporal structurization is usually more highly differentiated, and also permits greater perceptual freedom on the part of interpreters. Plays, novels, scientific papers are structurally complex as contrasted with a road sign or a single, attention-attracting signal, e.g., Hey there! Communications content may be distinguished from the context in which it appears. The "timing" of an official announcement, the setting of a scene in a play, the psychological properties of a particular communications medium, or the status and personality of a speaker are examples of context. These contextual aspects of the stimulus are sometimes referred to as independent extraneous factors designed by such terms as "suggestion" or "prestige." Asch (3) has recently discussed this and pointed out that content of a statement may not be separated from its context, and that content is psychologically changed by context. Considered as a stimulus field to which interpreters respond, however, content and context are a unified whole or gestalt.

The communicator or his surrogate is a part of the context in every communication. In responding to content the interpreter, vaguely or clearly, structures its source. In some cases the communicator's characteristics, real or imagined, play a major role in so far as the effects on the interpreter are concerned.

COMMUNICATIONS SITUATION.   Communication occurs in a situation possessing quasi-physical, quasi-social and quasi-psychological properties which in-

[3] Much current communications research is concerned with interpreter responses to communications content either during exposure (called *response analysis*, [35]) or subsequent to exposure (called *effects analysis*, [14, 19, 23]). The last, of course, is subject to intervening experiences of the interpreter and, strictly speaking, is not part of the communicative situation. Especially significant from the point of view of the conceptualizations proposed are the studies of how particular interpreters utilize communications content. Merton's study of the Kate Smith broadcasts (30), and the studies of daytime radio serials by Arnheim (2), Herzog (16) and Warner and Henry (43) contribute relevant data.

duce and determine the course of behavior of communicators and interpreters. A primary characteristic of this field as perceived by either the communicator or interpreter or both is its lack of a clear and stable organization. Correlated with the perceived instability is an increase in tension on the part of the potential communicators and interpreters. This is the "need to communicate" and the "need to be communicated to." [4] The situation is cognitively restructured by the produced content, and the communication may be said to occur when the perception of such content brings communicators and interpreters into dynamic relationships. Existing tensions may be either increased or reduced depending on the perceptual-need systems of the individuals involved, and the specific character of the communications content. The central importance of sign-symbol material in bringing about these effects for man is related to his unique capacity as a symbol-producing and symbol-manipulating organism.

The dynamics of the interrelated parts of the communication situation may be summarized as follows:—(a) the existence of specific tensional states related to perceived instabilities, disturbances, or needs in the psychological fields of the individuals involved; (b) the production of a structured stimulus field (communications content) consisting of signs and symbols; and (c) the achievement of a more stable organization through cognitive restructuring of the fields induced by such content. The relationships in the communication situation have a strategic character in that they involve a variety of manipulatory activities through which individuals strive to achieve an understanding of each other and their environments. This is the meaning of communication in human society.

It is necessary to distinguish the interactions between individuals in the communication situation from other forms of social interaction. Recent papers by Maslow (28) and Arnheim (1) discuss a form of interaction between organisms which closely resembles communication. *Expression* or *expressive behavior* refers to postural, gestural (including vocalizations), and other bodily changes which are perceived and cognized by others. Arnheim notes that the general appearance and all the overt activities of the body may be "expressive." The flushed face, the upraised fist, the sagging shoulders are stimulus patterns which may be perceived and cognized in various ways by another organism. But these interactions are *not* communication, although they may easily be confused with it.

Maslow differentiates instrumental behavior, or "coping" behavior, as he terms it, from expressive behavior. Coping behavior is "essentially an interaction of the character with the world, adjusting each to the other with mutual effect." Noninstrumental or expressive behavior, on the other hand, "is essentially an epiphenomenon of the nature of character structure." Coping behavior is characteristically motivated, determined by environmental and cultural variables,

[4] A wide range of "needs" may be served in communication situations. The studies of Herzog (16), Warner and Henry (43) and Arnheim (2) show how particular interpreters seek specific satisfactions from communications content.

easily controlled, designed to cause changes in the environment, concerned with need-gratification and threat-reduction, and highly conscious.[5] The act of producing content in the communications situation may be regarded as a special case of coping behavior. The borderline case between a communicative interaction would be the smile which is "expressive"—presumably of some bodily affective state—and the smile that is produced with intent to affect the behavior of another. It may be difficult to establish criteria to differentiate between expressive behavior and communication, but the reality and importance of the distinction must be accepted.

In addition to its instrumental or homeostatic role, communication is essentially creative. This is partly the result of the central role and unique potentialities of signs and symbols. The structuring processes resulting in the produced content may represent new (emergent) insights for both the producer of the content and the interpreters, and are essentially creative acts, perhaps the prototype of all creative activity in the arts and sciences. "Creative" as used here means that the resultant of the structuring process—the "structure"—is not merely a summation of existing elements, but a gestalt possessing properties different from those of the component elements. The structuring process is creative also in the sense that it does not necessarily depend on antecedent experience (learning) or innate factors in the individual. In this connection the comments of Chein (13) seem applicable to the communications situation when he says, "The important dynamic fact is *how the person perceives the situation and what he wants in it* rather than the fact that learning had previously taken place." (Italics added.) Chein believes there is an "intellectual trap" in the assumption that a psychological process must be accounted for as either learned or innate. "We believe that new insights do arise, and we see no good reason why novel features of current situations should not be perceived or why previously unnoticed features of repeatedly experienced situations may not be perceived for the first time."

COMMUNICATIONS CONTENT AND THE CONCEPT "INTENT." The special, almost unique, characteristic of the communication situation is the production of a stimulus field possessing special characteristics which differentiate it from other stimuli to which organisms respond. These are: (a) it is *produced* by one or more individuals in the communication situation with the *intent* of structuring the fields of both its producers and interpreters; (b) it utilizes sign-symbol materials which have common significations for both the producer and interpreters; and (c) it implicates specific interpreters and communicators who are assumed to possess certain need patterns and perceptual capacities for which the produced content is relevant.[6]

[5] Similar distinctions have been made by others. Lewis (26), for example, distinguishes between the "declarative" and "manipulative" use of language by the child.

[6] Schneirla has recently (36) emphasized the same point of view in his discussion of the distinctions between subhuman and human "communication." He notes that social inter-

The construct intent in (*a*) above refers to the fact that the act of producing content is *directed* rather than random or aimless, and implicitly or explicitly assumes future effects. We have noted that the production of communications content appears to be a special case of coping behavior as defined by Maslow, especially as it reflects the perception of a concrete social situation, and the need-value structure of the communicator. In this sense intent is very similar to Cantril's (12) "expectancy," which he defines as "our present reaction to the future in terms of what will happen to us if we do (or don't) do certain things now." As Cantril points out, what really concerns us "now" are possible future effects—effects which we may be able to modify. Intent is correlated with a tension system, and may be generalized as a need to communicate.

The intent of the communicator in producing specific content is not only concerned with expected effects on interpreters, but assumes they possess particular need patterns and perceptual capacities. In other words, *in the act of producing content, the interpreters are always in the psychological field of the communicator*. The communicator's perceptions of the interpreters may determine the character of the content he produces. The degree of specificity with which these presumed effects are defined by the communicator may vary widely from one communication situation to another, but clearly or vaguely they are dynamically a part of the communication situation.

It does not follow from this, however, that the communicator always produces content which is directly responsive to interpreter needs or reactions. In face-to-face communications, for example, where communicator and interpreter physically are in each other's presence, the produced content is more likely to be adjusted to the immediate responses of the interpreter. In a large proportion of human communications the communicator and interpreter are separated spatially or temporally. Here the communicator produces content on the basis of assumptions about interpreters which he may or may not be ready or able to modify in terms of interpreter response. In the limiting case, either because the communicator conceives the communication in strictly linear terms and hence is psychologically incapable of modifying content, or because of technological limitations of the medium used which make modification of content difficult or impossible, communication may break down completely.

In producing communications, the intent-pattern of the communicator may bear a significant relation to his role in the power-structure of the groups, subcultures, or class in which he has membership. This has important theoretical

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change in insects resembles human communication only superficially. In human communication, according to Schneirla, the following criteria are met: (*a*) symbols are used intentionally with respect to anticipated consequences; (*b*) they have meaningful connections with objects and situations; (*c*) they influence both the user and the interpreter in characteristic ways; and (*d*) they are patterned according to the motivations and perceptions of the communicator.

and practical implications, since it asserts a possible relationship between all communication and the power-structures in the culture. "Control" and "power," as those terms are used here, refer to the fact that communications content is the primary agency in human society through which individuals have social relationships with each other and with their physical environments. For example, the amount and quality of information available at any given time regarding any human problem are functions of the activities of specific communicators with specific intents. Such information may furnish the frame of reference for human action, and in this sense controls. However, since the relationship between communicator and interpreter is not a simple linear one in which certain content is produced and transmitted intact to recipients, control is not necessarily communicator centered. Rather, it is complex and interdependent, involving feed-back mechanisms of the type recently described by Norbert Wiener (44). Insofar as the communicator recognizes and adjusts to the need-structure and perceptual capacities of the interpreter, he shares control with him.

CONTENT ANALYSIS.   The stimulus material produced by the communicator under the organizing forces just described is defined operationally as an organization of sign-symbols which may be subject to *content analysis*. Content analysis refers to a specific set of procedures, the object of which is to make available quantitative and qualitative statements regarding communications content.[7] One effect of this requirement is that communications content must be capable of being reproduced in permanent form.

The characteristics of this stimulus must be established by procedures applied independently of particular communicators and interpreters. Such an analysis establishes a set of reference points with respect to which other aspects of the communications field—for example, the intent of communicators, including their emotional and personality dynamics, or effects on interpreters—may be validly and reliably appraised. Content analysis may be carried out in accordance with a highly rigorous design, or be relatively impressionistic—the professional critic's review of a novel is a form of content analysis—but it is essential to any systematic study of communication situations.

If the analysis is to claim any degree of scientific rigor it must meet reliability and validity tests, the analysts must be trained in the use of the procedures, and the categories used must be based on objective criteria.[8]

SIGN-SYMBOL MATERIAL.   A second characteristic of communications con-

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[7] The technique and problems of content analysis are discussed in Lasswell and Leites (25), Berelson and Lazarsfeld (4), and Spiegelman, Terwilliger, and Fearing (42). Examples of the application of these techniques to particular contents are White (44), and Spiegelman, Terwilliger, and Fearing (40, 41). The use of less rigorous techniques are illustrated in Kracauer (24) and Wolfenstein and Leites (48).

[8] The techniques for determining validity and reliability are discussed by Janis (20), Kaplan and Goldsen (21), and Spiegelman, Terwilliger, and Fearing (42).

tent is its utilization of signs and symbols. The definitions proposed by Charles Morris (32), and the general theoretical orientation of George Mead (29) are used in the present discussion. Morris's definition of a symbol as a sign produced by its interpreter that acts as a substitute for some other sign with which it is synonymous is adopted here.

Mead has recognized the enormous implications for society of the symbol-using processes. For him symbols are not merely sense-stimuli to which mental states—"meanings," "concepts," "ideas," etc.—have become attached. They are gestures, and are "significant" because the communicator who produces the gesture incipiently responds to it in the same way as the individual to be affected by it—in Mead's terminology, "the other." This, for Mead, is the essence of the social process. Communication "is not simply a matter of abstract ideas, but is a process of putting one's self in the place of the other person's attitude, communicating through significant symbols" (p. 327).

Morris points out that although "spoken-heard" signs (language) play a central role in the life of man these are not the only types of symbolic material. An important type of nonlinguistic symbolic material is that which Morris terms "iconic." An iconic sign is any sign which is similar in some respect to that which it denotes. Both auditory and visual signs may be iconic. Morris notes that ". . . photographs, portraits, maps, roadmarkers, models are iconic to a high degree; dreams, paintings, pageants, the dance, dress, play, and architecture are iconic in varying degrees" (p. 190). A form of communications content involving what Morris calls the "iconic performance of actions" is of particular importance in current communications research. Examples include ritual, film and stage performances, storytelling, comic strips, and many others.

SOME DIMENSIONS OF COMMUNICATIONS

In terms of the theory here presented the communicator, content, and interpreter are "in" every communications situation and are dynamically related. It would be useful to conceptualize these relationships in terms of hypothetical properties or dimensions which are dependent on specific variables in the communications situation. It should be possible to define a given communication situation by its position on a variety of such dimensions. Several problems present themselves. In the first place, it is necessary to establish the univocality of each dimension and the objective criteria to be used in fixing any position or series of positions on it. Second, there is the problem of describing, and, for experimental purposes, controlling, the variables which underlie each continuum and determine the positions thereon. Ultimately, of course, it would be necessary to determine the kind of relationships existing between the various continua. The suggested dimensions which follow are to be regarded as highly tentative. The possibilities are not ex-

hausted and it is possible that those proposed will not survive experimental analysis.

SPECIFICITY OF INTENT. This dimension defines the definiteness with which the communicator envisages the effects of the content he produces. Intent is a manifestation of the need-tensional variables in the personality structure of the communicator; it acts as a selector and organizer of material. It has already been pointed out that the interpreter is always part of the psychological field of the communicator in the act of producing content. The specificity dimension defines the potency of the interpreter image on content. It expresses itself in the degree to which the communication is *planned*.

Highly specific or "planned" communications are usually interpreter centered. The communicators are (*a*) explicit regarding the effects to be achieved on particular interpreters, and (*b*) consciously manipulating content in the light of these assumptions. A propaganda campaign, for example, is directed toward particular "publics" who are assumed by the communicator to have certain wants, to be alert or apathetic, stupid or intelligent.

Communications which are relatively unspecific, on the other hand, are to a greater degree communicator centered. That is, in general, the communicator is more concerned with expressing himself than with possible effects on others. In the limiting case at the unplanned end of the continuum, we do not have communicative behavior, but expressive behavior, in the sense of Maslow. At this end of the continuum we should expect to find material produced which in a larger degree reflects the personality structure and emotional dynamics of the communicator and is very slightly concerned with potential interpreters. Examples of relatively unplanned communications are face-to-face conversations, some, but not all, personal letters, rumors (except those which are "planted" for specific effects), diaries, and certain types of autobiographical material.[9]

A group of factors which are significantly correlated with high specificity of intent are those relating to the communicator's social role, especially his power role in the groups of which he is a member. Broadly speaking, all highly planned communications are power communications in the sense that specific behavioral effects are expected to follow specific content. The control of content assumes the control of these effects, and hence is closely connected with the power structures of the society. Lasswell (25) has discussed the concern of ruling elites, as he terms them, with communication as a means of preserving power. He notes that in the instance of conflicts between ruling elites there develops a struggle for the control of channels of communication.

Highly planned communications of this type are frequently produced by various types of professional communicators. These include public relations specialists, advertising copywriters, professional propagandists, publicity specialists,

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[9] These types of communications content are typically produced in the clinical situation and are analyzed for the information they yield regarding the personality structures of the subjects.

psychological warfare specialists, and others.[10] These communicators have a degree of professional competence in the use of symbols, particularly those required for a particular communications medium.

The assignment of a particular communication to a position on the specificity continuum may be based on data from two sources: (*a*) statements by or information about communicators; and (*b*) content analyses made for the purpose of inferring the character of the communicator's intent.[11] Information regarding the first might be based on the use of clinical techniques or from a variety of secondary as well as primary sources. These will, in themselves, be communications, and their analysis will have to take into account all the factors which are involved in the communicative process.

REALITY. This dimension refers to the degree to which a communications content reflects or is indentifiable with psychological or physical reality. Operationally, the degree of reality as here defined is a *function of the manipulatory activities of the communicator in producing content*. These include selecting, isolating, or otherwise ordering content and contextual variables. The degree of freedom which the communicator permits himself in arranging communications content determines the position of the content on the real-irreal dimension. A newsreel, "on the spot" radio broadcast, TV broadcast of an event, a map, a road sign occupy positions toward the "real" end of the continuum; that is, they are examples of content which has been subject to a minimal amount of arrangement or selection by the communicator. The perceptual responses of the interpreters to these cues may be ordered to a closely related authenticity dimension.

AUTHENTICITY. This dimension refers to the degree which communications content contains cues which the interpreter accepts as congruent with "reality" as he knows it. Such cues are in the content or provided by its context, and they are perceived by the interpreter as an indication that the content has been manipulated by the communicator. The objective reality of such manipulation is not involved. The newsreel, documentary, and fictional film are perceived by most interpreters as differing with regard to authenticity.

The cues which carry the signification of authenticity for the interpreter are, at least in part, the result of cultural conditioning. The label "newsreel" is in itself such a cue—and is part of the context in the presentation of the film; the use of nonprofessional actors in a documentary and the use of natural settings are cues of authenticity. "Objective" reporting is accepted as authentic as contrasted with "interpretive" reporting, because of numerous cues signifying "objectivity" in the former. These cues may be simulated with intent. An example of the re-

[10] The specific character of the intent of these specialists, their research techniques, selection of content, and strategies of presentation have been described by a professional public relations counsellor, Edward L. Bernays, in a recent article (5) which `·'` significant title *The Engineering of Consent*. See also Merton (30).

[11] White's analysis (44) of *Black Boy* for the purpose of understanding t value system is an example.

sults of such simulation was the famous broadcast *War of the Worlds*, which had high irreality, but, we may assume, was unintentionally authentic for many interpreters. In this case the cues for authenticity were psychologically more potent than the specific indications of irreality.

AMBIGUITY. This dimension is concerned with properties of communications content which make it susceptible to variant structurizations by interpreters. A content may be said to be *relatively unambiguous when it is maximally resistant to such variant structurizations*. In the limiting case it would be susceptible to only one structurization. This definition of ambiguity is consistent with that discussed in the recent paper by Luchins (27). Luchins suggests that an "ambiguous stimulus field is one which allows various structurizations." Luchins notes that ambiguity and structural clarity of the stimulus are not in a simple dependent relationship. Rather, the question is the extent to which a given content permits variant interpretations. *All communications contents are in some degree ambiguous*. This may be termed the Principle of Necessary Ambiguity, and is basic to the understanding of all communications effects. Examples of ambiguous content are those found in the analyses of the deviant responses to the Mr. Biggott cartoons (22), and to the *War of the Worlds* broadcast (11). The study of Wiese and Cole (46) on children's responses to the film *Tomorrow the World* shows the extent to which apparently unambiguous thematic material is subject to variant meanings.

The important variables are in the content (including context). These include structural simplicity or complexity, amount of detail, etc. It is probable that content which is structurally simple, for example, a road sign, will be less ambiguous than content which is complex, for example, a scene in a play.

CONGRUENCY. This dimension refers to the degree to which the presented content is relevant to the need-value-demand systems of the interpreter. The relevant variables are those in his need-value structure and symbol-manipulating habits, conceived as acting on content of specific structure. For example, interpreters with specific and persisting goal integrations, strong value orientations and stereotypes, specific prior experience in or involvement with particular content, or any other form of persistent set will either reject (in the limiting case) or markedly modify presented content in the direction of greater congruity with their predispositions. Their perceptions of specific content will be deviant as compared with the perceptions of interpreters whose need-value system is less rigid, or to a greater degree is congruent with the presented content. In other situations the intensity and specificity of need for a structured field—that is, need for information, guidance, direction, or "meaning"—will determine the degree of congruence of presented content. The familiarity with the symbols used in particular content, and the degree to which they have common significations for communicators and interpreters are, of course, fundamentally important variables.

The relation between the congruity and ambiguity dimensions is close but

not a simple dependent one. Current discussions (15, 31, 33) of the personality variables in perception contain data relevant to the dynamics of these relation-ships. The effects of predispositions or sets (also called "hypotheses") of great strength on the perception of stimulus material that is relatively ambiguous are discussed by Miller (31). He notes that personality and motivational factors will have maximum effects on the emergence of perception in situations where infor-mation is ambiguous. Bruner (7) also notes that "the less ambiguous the infor-mation, the less the effect of past experience in confirming hypotheses and the greater the use of input information."

By definition, an ambiguous communications content is permissive of a large number of structurizations. Such content would presumably be congruent with a wide variety of interpreter predispositions.[12] Each would be able to per-ceive what he wished to perceive. On the other hand, a highly unambiguous con-tent might be either congruent or highly incongruent with particular interpreter predispositions. If congruent, the result would be acceptance with minimal modi-fications. If incongruent, the result might be rejection in the limiting case, or in-tense conflict. The study by Wilner (47) previously referred to on the perceptual processes of highly prejudiced and relatively unprejudiced persons of a motion picture film *Home of the Brave* contains relevant data. Certain characters in the film are presented relatively unambiguously as regards their attitudes towards Negroes. Such unambiguous characterizations were highly incongruent with rigid attitude-value orientations of some of the subjects. The unambiguity of the characterizations makes it difficult for these subjects to misperceive ("distort") them, with the result that the subjects are thrown into conflict. Communications content of this type is, of course, structurally complex, that is, has many themes and subthemes other than those that are congruent or incongruent with particu-lar need-value systems of interpreters. This may enable them to avoid the conflict by perceiving other aspects of the content—in the case of the film mentioned above, other traits of the character.

It is possible to postulate the outcomes (effects on interpreters) of certain hypothetical limiting cases in which congruency and ambiguity vary with respect to each other.

Case 1: High intensity (rigidity) of interpreter sets of "hypotheses" plus highly ambiguous content.

Result: Interpreter readily *projects* with the result that the content is given a firmer structure or restructured in the direction of interpreter's hypotheses.

Case 2: High intensity of "hypotheses" plus unambiguous content. Result: Inter-

[12] The Wiese-Cole study (46) is a case in point. Children from differing socioeconomic classes perceived quite different meanings in the anti-Nazi themes in the film *Tomorrow the World*.

preter readily *identifies* if content is congruent with hypothesis. If content is not congruent conflict results in various patterns of evasion and rejection, or interpreter may "leave the field" entirely.

Case 3: Low intensity of "hypotheses" plus ambiguous content. Result: Interpreter may seek more firm structurization utilizing whatever cues are available, or he may be indifferent and relatively unaffected.

Case 4: Low intensity of "hypotheses" plus unambiguous content. Result: Interpreter may identify with content.

In the foregoing hypothetical cases it is assumed that a specific communications field exists in which all other parameters are constant. The constructs "identification" and "projection" are employed to indicate the direction of the relationship between interpreter and content. In general, "identification" refers to the situation in which conditions are optimal for the acceptance by the interpreter of the structurizations offered by all or part of the content. "Projection" refers to the situation in which the interpreter is able wholly or partially to restructure the content in a manner consistent with his dominant hypotheses. The terms are not mutually exclusive. Rather, they may be conceived as "pulls" in which the direction of structurization in the communications situation is determined by the relative strengths of the need-demand system of the interpreter and the clarity of the content itself. This can be determined only by analyses based on relevant data regarding the need-demand systems (hypotheses) of interpreters and content analyses in a specific communications situation.

SUMMARY

A conceptual frame of reference for human communicative behavior has been proposed which places it in the context of current personality-perceptual theory. Specific dynamic relationships between communicators and interpreters are hypothesized. These are distinguished from other forms of social interaction by (a) their instrumental-creative character and (b) the production of a stimulus field possessing particular properties. Both the production and response to this field are determined by perceived instabilities in the environment as related to the need-value systems of communicators and interpreters. In responding both communicators and interpreters cognitively restructure the situation in the direction of a greater understanding of each other and their environments. Some of the dynamical processes in the communications situation are expressed genotypically in the form of hypothetical dimensions.

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PART II
COMMUNICATION THEORY: SYSTEMS

A communication system or model affords the communication scientist with one of the simplest and oftentimes most useful ways of cutting through some of the enormous complexity of human interaction. A model is, in essence, an analogy, a replication of relationships that supposedly determine the nature of a given event. The logic behind the use of such models is that they are capable of reducing a complex event to a more manageable, abstract, and symbolic form. When properly constructed, models serve the interests of scientific research and theory building in several ways. Models have the advantages of providing a frame of reference for interpreting complex events, stimulating new ways of thinking about the dynamics of human behavior, and often aid in scientific prediction.[1] Models, then, may be used to describe or predict and may assume many forms, including verbal, statistical, diagrammatical, and mathematical.

Mathematical models of communication originally developed in the field of cybernetics by those who insisted that "from the point of view of communication, the human organism is not essentially different from a machine." In "An Introduction to Cybernetics and Information Theory" Allan R. Broadhurst and Donald K. Darnell discuss the principles and logic behind cybernetics and information theory and indicate the relevance of mathematical models for communication processes generally, whether they take the form of an electronic impulse, spoken word, or gesture.

In an extension of the early work in cybernetics, Bruce H. Westley and Malcolm S. MacLean, Jr. use the concept of "feedback" for "A Conceptual Model for Communications Research." The authors present a model which they regard as "sufficiently general to treat all kinds of human communication from two-person, face-to-face interaction to international and intercultural communication."

Cybernetic-type models have considerable theoretical and heuristic value for the study of communication; they cannot, however, be transformed uncritically from their

[1] A. Chapanis, "Men, Machines, and Models," *American Psychologist*, 1961, *16*, 119–125.

original fields to the behavioral sciences. Cybernetic models are limited, for one thing, in neglecting variables that are critically important in the study of human interaction, particularly the nature and influence of the social context. Humans, unlike mechanical systems, must constantly monitor and adjust to the physical and social situation in which they find themselves. In proposing a "Transactional Model of Communication" Dean C. Barnlund emphasizes the importance of social context as a determinant of communicative outcomes. The evolution of meaning in interpersonal communication is, as Barnlund writes, dynamic, continuous, circular, unrepeatable, irreversible and exceedingly complex. Meaning is not simply a *given* or a *constant* to be assumed; it is rather, "created" or "invented" by communicators as they react to physical and psychological cues of the other communicators along with environmental cues of time and space.

Much of the early work on communication systems typically described the communication process as linear in nature; communication was depicted much like a conveyer belt as a sort of one-way transmission of messages to some final destination. The more sophisticated, later models tend to describe communication as two-way, but circular. In his essay "A Helical Model of Communication" Frank E. X. Dance criticizes the circular-type models in implying that "communication comes back, full circle, to exactly the same place from which it started." This aspect of the circular analogy, Dance maintains, is "manifestly erroneous and could be damaging in increasing an understanding of the communication process and in predicting any constraints for a communicative act." Dance, therefore, proposes a model based upon a helical spiral as a solution to the shortcomings inherent in circular or linear models of communication.

Most communication models describe interaction in an abstract and general way. Edward Mysak in "Speech System" outlines a model which deals specifically with human speech. Mysak describes human speech in the rather formidable sounding terms of a "closed, multiple-loop system" containing "feedforward and feedback mechanisms." Mysak uses these concepts in a description which clarifies the nature of human speech production.

AN INTRODUCTION TO CYBERNETICS AND INFORMATION THEORY

Allan R. Broadhurst and Donald K. Darnell

Norbert Wiener's now-classic work entitled *The Human Use of Human Beings: Cybernetics and Society* reveals the thesis that "society can only be understood through a study of the messages and the communication facilities which belong to it." [1] Communication is assuming not only an important role in our society, but in the society of the world. It is not surprising that the science of communication now includes many diverse fields of interest. In addition to the applied science of rhetoric, we now have the basic science of communication theory. As reported in a recent article by Wayne N. Thompson, entitled "A Conservative View of a Progressive Rhetoric," "Logic, ethics, politics, and philosophy are the antecedents of rhetoric, whereas engineering, electronics, mathematics, biology, sociology, and psychology are among the sources of communication theory." [2] It

[1] Norbert Wiener, *The Human Use of Human Beings: Cybernetics and Society* (New York, 1954), p. 16.

[2] Wayne N. Thompson, "A Conservative View of a Progressive Rhetoric," *QJS*, XLIX (February 1963), 5.

no longer seems strange for rhetoricians, experimental psychologists, communication theorists, and communication engineers to work side by side on common problems.

One of the principal contributions in the last two decades to the field of communications has been in the area of cybernetics—from which information theory is derived. Cybernetics is a field of study which seems destined more and more to find its way into the periodicals and literature of the speech scholar. Many such scholars, with a background emphasizing classical rhetoric, have neither the mathematical sophistication nor the unlimited time necessary to master a total comprehension of this new field. This paper is an attempt to provide fundamental information for those who have only a general interest in "cybernetics" and "information theory," and to prepare those with an abiding interest for the more thorough, detailed works.

The late Norbert Wiener, professor of mathematics at the Massachusetts Institute of Technology, first coined the term "cybernetics" from the Greek word *kubernetes*, or "steersman," the same Greek root from which we get our word "governor." Though the word was first used publicly by Wiener in 1948, it has now been used retrospectively to cover the whole field of communication and control which originated years before. Cybernetics is a philosophy which insists that, from the point of view of communication, the human organism is not essentially different from a machine. It emphasizes the resemblances between living organisms and man-constructed machinery, and points out that even though the components differ, in theory their operation is essentially the same. In effect, this means that the scientist can treat the human communication process as if it were being conducted by machines, and he is concerned with the building of machines that can "think," "learn," and "communicate." [3] As Norbert Wiener commented, "When I give an order to a machine, the situation is not essentially different from that which arises when I give an order to a person. In other words, as far as my consciousness goes I am aware of the order that has gone out and of the signal of compliance that has come back. To me, personally, the fact that the signal in its intermediate stages has gone through a machine rather than through a person is irrelevant and does not in any case greatly change my relation to the signal." [4] It is not surprising, then, that Mr. Wiener thought of messages between "man and machines," "machines and man," and "machine and machine" as playing an ever-increasing part in our society.

With any new word or idea, widespread recognition is slow in being achieved. This is particularly true in regard to the term "cybernetics" because we are disposed to think in emotional ways about the words "machine" and "mechanical." In the past "machine" has applied merely to the simple constructions

[3] F. H. George, *Automation, Cybernetics, and Society* (New York, 1959), pp. 45–46.
[4] Wiener, p. 17.

of man. Thus, bicycles, automobiles, airplanes, industrial equipment, and motors are quickly brought to mind when the term "machine" is used. "Mechanical" is a word "used to describe actions that are automatic and unthinking, precisely in opposition to the human characteristics of reflection, thoughtfulness, insight, and so on." [5] Therefore, to say that a machine or mechanical object can think and communicate is a barrier to many that is difficult to overcome.

However, cyberneticians do see the similarity between machines and organisms as being so great that the specifications for one appear to include the specifications for the other. They mean the word "machine" now to apply to something far more complex than any existing machine. In effect, a better way to put it would be to say that they feel organisms are essentially constructible. As F. H. George puts it, "There is no reason, in principle, why we should not ourselves construct human beings. Needless to say, many cyberneticians would stop short of this claim, and their work does not in any way depend on it. What is important is that we can build machines that will perform all the more mechanical tasks that humans perform. This is the extent to which automation is fostered, but cybernetics casts its net much further afield than automation. It implies a whole philosophy of science and, taken in the broader social context, a human philosophy of life." [6]

The Second World War highlighted the need for extensive research in the area of cybernetics. The war provided a series of problems never before encountered. For the first time in the history of warfare missiles, rockets, and planes were approaching and passing the speed of sound. The main problem became one of range-finding for anti-aircraft guns in high-speed aerial warfare. The older systems of manually-controlled buttons, gauges, and calculations were totally inadequate in this new war. The need now was for speed and accuracy in the overall tracking of objects speeding through the air—predicting their direction, height, and velocity so that this information could aid in their destruction. To meet this need, machines were programmed in such a way that they could make decisions and instruct the various parts of the anti-aircraft guns to operate on the basis of their decisions. In other words, machines were "thinking" and "communicating."

The advancements made during the war undoubtedly led to the post-war boom in computing machines. Computers are one of the chief reasons for the cybernetics hypothesis about machinery and organisms. These and similar machines are capable of making deductive inferences, solving mathematical problems, classifying information, and making predictions that are based on inductive reasoning. In effect, they are being taught to "think," "learn," and "communicate."

Thus, one notes that a new theory of information was being developed. The

[5] George, p. 46.
[6] *Ibid.*

theory was concerned with the problem of defining the quantity of information contained in a message to be transmitted, and how to go about measuring the amount of information communicated by a system of electronic or machine-like signals. Largely through the independent efforts of Norbert Wiener and Claude Shannon, this new theory of information has been applied to a mathematical theory of communication. This mathematical theory of communication refers to every conceivable kind of transmission of information—from the first words of a baby to the complicated theories of an atomic scientist. The units of information are numerous—muscle contractions, sine waves, phonemes, morphemes, syllables, words, phrases, clauses, sentences, paragraphs, letters of the alphabet, numbers, parts of speech, et cetera. The only real restriction is that one must be able to recognize the unit whenever it occurs so it can be mathematically programmed and fed into the machine.[7]

The work of the information theorist can be likened to that of the mapmaker who presents a traveler with a record of the important towns, highways, and sites of historical interest. But the towns are only dots and the rivers are only lines and all the exciting adventures along the way are missing—the interesting details and beautiful scenery are deliberately omitted. In a similar way information theory does not involve the value-judgments of the human element. The engineer who designs a telephone system does not care whether this link is going to be used for transmission of gossip, for stock exchange quotations, or for diplomatic messages. The technical problem is always the same—to transmit the information accurately and correctly, whatever it may be. At present, then, information theory treats information as a physically measurable quantity, but it cannot distinguish between information of great importance and a piece of news of no great value for the person who receives it.[8]

What then is this "physically measurable quantity," and how is it achieved? It is what is frequently referred to by communication theorists as a "bit" of information and is achieved through the use of a binary coding system. Gustav Herdan states in his book *Type-Token Mathematics* that "our brain and nervous system work in such a way that a nerve cell is either excited or not, which means that it can assume either of two mutually exclusive states, but not both at the same time." [9] In other words, the nerve cell can make a Yes-No decision, All-or-Nothing decision, or an 0-1 alternative. This is in accordance with the principle known in logic as that of Contradiction, and, "since language is, in the last resort, only the formulation of logical relations in terms of linguistic forms, it seems sensible to conclude that a dual or dyadic symbol system will be appropriate for language." [10]

[7] George A. Miller, *Language and Communication* (New York, 1951), p. 82.

[8] Leon Brillouin, *Science and Information Theory* (New York, 1956), p. xi.

[9] Gustav Herdan, *Type-Token Mathematics, A Textbook of Mathematical Linguistics* (The Hague, Netherlands, 1960), p. 173.

[10] *Ibid.*

A coding system with only two symbols falls neatly into this Yes-No principle. An application is the Morse Code of telegraphy with its Dot-Dash symbol system. If for a number system of this kind one chooses 0 and 1 as symbols, one has the so-called Dual, Dyadic or Binary number system in which all numbers are written by means of 0 and 1 only. In contrast to this, one may consider our decimal number system which makes use of ten digits, 0–9 inclusive. The binary system, however, can be used as the basis for all number codes or alphabets. For example, a possible binary system to replace our decimal system could be as follows:

Decimal system	Binary system
0	0
1	1
2	10
3	11
4	100
5	101
6	110
7	111
8	1000
9	1001
etc.	etc.

A possible binary code for the letters of the English language could be:

Letter	Binary code
e	100
t	1000
o	1100
a	10000
n	10100
i	11000
r	11100
s	101000
h	101100
d	110000
etc.	etc.

Any determined units of information could be signified by such a binary coding system—whether the units be sine waves, phonemes, syllables, paragraphs, or letters of the alphabet. The only real restriction, again, is that the units must be defined in such a way that they can be recognized whenever they occur so they can be mathematically programmed and fed into the machine.

There are also experimental devices which give the possibility for using positive or negative pulses, in addition to no pulse. This is the case for magnetic tape and for systems using positive and negative current. These systems lead to the

possibility of a ternary code which is based on —1, 0, +1. One of the three signals (—1, for example) may be used for the letter space, thus leaving the two remaining signals to be used as binary coding for the letters.[11] The coding would look like the following:

Letter	Code
e	0,-1
t	00,-1
o	01,-1
a	10,-1
n	11,-1
i	000,-1
r	001,-1
etc.	etc.

Used in the programming of information, mathematics becomes a precise and well-structured language. It is a language which seems to be quite basic to our descriptions of the world. It is a language that picks out the most general structural relations in any situation capable of description. But it can also be an abstract language capable of dealing with structural relations that exist only as we define them—such as morphemes, phonemes, and syllables.

Information theory, therefore, is not concerned with information at all—not in the common meaning of the term "information." Information theory does not deal with meaning, with message content, with knowledge about a subject. Why, then, is information theory so important to communication? It is because the transmission of "information," eliciting meanings in others, requires a code—a set of symbols and a set of rules for combining them—and information theory is concerned with codes and the capacities of channels.

Information is something we need when we face a choice, and the amount of information needed to make a decision depends on the complexity of the choice involved. If we face many different equally likely alternatives—in other words one is just as apt to happen as the other—then we need more information than if we faced a simple choice between just two alternatives, either this or that.

As Claude Shannon uses the term, *information refers to knowledge that one does not have about what is coming next in a sequence of symbols*. He thus associates information with *entropy*, which is nothing more than randomness, or the lack of predictability. Warren Weaver referred to entropy in the physical sciences as being a measure of the degree of randomness or "shuffled-ness" in a situation.[12] He goes on to point out that there is a tendency for physical systems to become less and less organized, and for entropy to increase. As Norbert Wie-

[11] Brillouin, p. 53.

[12] Claude E. Shannon and Warren Weaver, *The Mathematical Theory of Communication* (Urbana, Ill., 1949), p. 103.

ner stated it, "The commands through which we exercise our control over our en-
vironment are a kind of information which we impart to it. Like any form of
information, these commands are subject to disorganization in transit. They gen-
erally come through in less coherent fashion and certainly not more coherently
than they were sent. In control and communication we are always fighting na-
ture's tendency to degrade the organized and to destroy the meaningful; the
tendency, as Gibbs has shown us, for entropy to increase." [13]

The relationship between the two terms "information" and "entropy" can
perhaps be made clear by the following example. Consider a source who is
successively selecting discrete symbols from a set of symbols; if those symbols
are independent and equally probable, that source has a maximum freedom of
choice, the uncertainty about what the next symbol will be is maximum (there-
fore, there is maximum entropy in the situation) and X bits of information are
required to make the next symbol predictable. Once the source has made his
choice there is no longer freedom of choice, no uncertainty or randomness (thus,
no entropy), and it is a short leap to the assumption that X bits of information
have been transmitted (or received). That assumption, however, is the trigger to
a painful and frustrating semantic trap. Having made that assumption, one be-
gins to talk (and think) about information transmitted, and slowly, but almost
inevitably, he loses the ability to discriminate between information and "infor-
mation." A useful memory device is to think of the information of Claude Shan-
non as coming in units referred to as "bits." The word "bit" as in a "bit of
information" is not to be confused with the popular use of the term. "Bit" in in-
formation theory is a combination of two shortened words, binary digit, and has
a precise mathematical value; whereas, ordinary information comes in "pieces"
which are vague undefinable chunks.

To demonstrate how important this difference is, one may consider a source
who is going to draw a card from a shuffled deck of playing cards. The deck of
playing cards represents a set of fifty-two equally probable, discrete symbols.
How many *pieces* of "information" would an astute observer obtain by watching
the drawing of one card? It might be said that he obtains one piece—the card
which was drawn—or fifty-two pieces, because he knows not only the one card
that was drawn but the fifty-one cards that were not drawn. He might also ob-
serve that the card just drawn is a "higher card" than one drawn previously, that
our source is the "winner," that $10.00 will now change hands, and so on. For
now, the important point is that information theory does not concern itself with
this kind of information. It is more concerned with "bits."

Now, how many *bits* of information are there in this situation? A *bit* is de-
fined as that amount of information required to halve the alternatives; i.e., the

[13] Wiener, p. 17.

number of bits of information in a set of equally probable alternatives is equal to the number of times the set must be divided in half to leave only one alternative. If there were two choices the set could be halved once; thus, there would be one bit of information. If there were four choices the set would have to be cut in two twice to reduce the alternatives to one; that is, two bits of information are required if the source has four equally probable choices. In the deck of cards, fifty-two equally probable choices exist, and it becomes difficult to obtain the number of bits by the halving procedure. There is, however, a simplified procedure for obtaining the answer desired. We find that two to the first power is two, and that two squared is four. We know (through our definition above) that a two-choice situation contains one bit of information, and a four-choice situation contains two bits, so we could infer that the power of two required to produce the number of alternatives is the number of bits of information in the system. As it works out, the power function is an inverse logarithmic function. That is, the logarithm to the base two ($\log_2$) of two is one, and $\log_2 4$ is 2. So, we find that for a set of equally probable alternatives the $\log_2$ of the number of alternatives is the number of bits of information required to predict the one that will be chosen. Since tables are available for this logarithm, one can easily find that $\log_2 52$ is 5.70044, and that approximately 5.7 bits of information are required to predict the card that will be drawn from a shuffled deck of playing cards. To put this another way, one would have to ask, on the average, 5.7 questions to be answered "yes" or "no" by some all-knowing power before he could predict with complete certainty the next card to be drawn; and each question asked would be designed to halve the alternatives.

Thus, he might first ask: "Is it red?" The answer will convey to him one bit of information. If the answer is "yes," he obviously knows the card is either a heart or a diamond. If the answer is "no," he knows it is a club or a spade. For purpose of the example, let us suppose that the answer is "yes." He then would ask "Is it a heart?" the reply is "no"; therefore, two bits of information have been conveyed—and he now knows the card is a diamond. He knows there are thirteen diamonds in a deck and now has the task of finding, with as few questions as possible, which diamond it is. The third question would be "Is the card lower in rank than number eight?" The answer is "no" (third bit). He knows the card is between eight and the ace. Again he halves these alternatives by the question "Is it lower in rank than Jack?" The answer "no" provides him with his fourth bit of information. The fifth question would be "Is it lower in rank than King?" and the reply is "yes" (fifth bit). He now knows the card is either the Jack or the Queen of Diamonds. By now asking "Is it the Jack of Diamonds?" he can be certain by the "yes" or "no" reply (sixth bit) what it really is. If the answer is "no," then he knows it is the Queen of Diamonds. If the answer is "yes," then he obviously knows it is the Jack of Diamonds. Thus, six

bits of information have carried him to the solution. With favorable answers he can get it in five—which reduces the average to 5.7.

It can be seen, then, that *bits* of information are not the same as *pieces,* and it can be observed that the bit is an arbitrarily defined unit which serves to quantify the uncertainty in predicting, or the information needed to predict, the next symbol to be drawn from a set of symbols.

So far, we have considered only that situation in which the alternatives are equally probable (i.e., the maximum entropy situation). We should emphasize that the 5.7 bits mentioned above in relation to the deck of cards is only accurate if the fifty-two alternatives are equally probable as in a shuffled deck of cards. We have observed that the number of bits of information is reduced as the number of alternatives is reduced (from fifty-two to four to two). Now, let us observe what happens when the probabilities are shifted.

To simplify the computations in the coming discussion, let us assume that we are interested only in the four suits in our deck of cards. That is, we now define our situation as having four alternatives each with a probability of $1\frac{3}{52}$ or .25. We could say from the previous discussion that in this situation, with four equally probable choices, two bits of information are required to predict the suit that will be drawn. To simplify further our computations, let us make one other observation. Four (the number of alternatives) times .25 (the probability of each alternative) times the $\log_2$ of .25 equals two. That is, $P1 \log_2 P1$ plus $P2 \log_2 P2$ plus $P3 \log_2 P3$ plus $P4 \log_2 P4$ equals 2, or, to state the general case $\Sigma\ p_1 \log_2 p_1$ equals the number of bits of entropy in a given set of symbols. (Actually, the logarithm of any number less than one is a negative number so we need a minus sign somewhere in our formula to make the result positive.) The formula for information, entropy, uncertainty, can now be stated (letting H stand for information and i for any alternative): $H = -\Sigma p_1 \log_2 p_1$. With this formula and a table of values for $-P \log_2 P$ we can now compute the entropy in any set of alternatives with any set of probabilities.[14]

Suppose we now take our deck of cards and withdraw four spades and two clubs and add six hearts. Again we are concerned with predicting the suit that will be exposed on the next draw. The probability that the next card will be a heart is approximately .37, a diamond .25, a club .21, and a spade, .17. If we insert these values in the formula given above we find:

$$-.37 \log_2 .37 = .5307$$
$$-.25 \log_2 .25 = .5000$$
$$-.21 \log_2 .21 = .4728$$
$$-.17 \log_2 .17 = .4346$$

$$\text{Total} \qquad 1.9381$$

[14] Edwin B. Newman, "Computational Methods Useful in Analyzing a Series of Binary Data," *American Journal of Psychology,* LXIV (April 1951), 252–262.

Thus, the four-choice situation with the probabilities .37, .25, .21, and .17 contains approximately 1.94 bits of information, entropy, uncertainty. We could also show by working some more examples that the more disparate the probabilities become the less entropy there is in the system, the less uncertainty there is in predicting the next symbol. If, for example, the probabilities were .75, .10, .08, and .07, only 1.2 bits of information are required to reduce the uncertainty to zero.

The next thing we might want to know is, "How does this *absolute* value—computed for a specific set of alternatives with a specific set of probabilities—compare with the *maximum* value that could obtain if the set of alternatives were equally probable?" We know that the *maximum* value for a four-choice set is 2 bits, and we have just computed an *absolute* value of 1.94 bits. If we divide 1.94 by 2.00 we will obtain .97. This value we call the *relative entropy* or *relative uncertainty*, and we can say that a four-choice situation which yields an absolute uncertainty value of 1.94 bits is .97 (97 percent as uncertain as it might be (i.e., as it would be if the alternatives were equally probable).

With the value we have called relative entropy we can compare systems with different numbers of alternatives and with different probabilities, but it should always be kept in mind that the relative entropy of a system of symbols (or the relative uncertainty of a source who is selecting symbols from the set) defines a relationship between the absolute and maximum entropy of a given set. Thus, a set of sixty-four alternatives and a set of eight alternatives could both have a relative entropy of .50, while the absolute entropy of the first set is twice that of the second.

One other concept from information theory can now be meaningfully defined, and that is *relative redundancy. Relative redundancy* is, simply, one (1) minus the relative entropy. Thus, in the example above where the absolute entropy was 1.94 bits, the maximum 2 bits, and the relative entropy .97, the relative redundancy would be .03. The redundancy figure represents *the degree to which the next symbol in a sequence is determined,* or the degree of certainty we might have about what the next card is going to be.

To summarize: given a source who is successively selecting discrete symbols from a set of symbols; if the symbols in the set have equal probabilities of being chosen next that source has maximum uncertainty, or there is maximum entropy in the situation. Maximum entropy is defined for a given set of symbols as the logarithm to the base two of the number of alternatives ($\log_2 n$). If there is some dispersion in the probabilities of the alternatives, the absolute entropy is computed by the formula $-\Sigma p_1 \log_2 p_1$. In the equally probable set both formulas produce the same result. Relative entropy is obtained by dividing the absolute entropy by the maximum entropy and has a value of one (1) when the alternatives are equally probable and a value of zero (0) when any alternative has a value of unity. One minus the relative entropy is the relative redundancy,

which is an index of the *predictability* of any given symbol drawn from the set.

When the set of symbols with which one is dealing is the alphabet or vocabulary of a natural language, and the task of the source is the composition of a message in that natural language, it is readily observable that the probabilities of the alternative fluctuate as the source proceeds with his sequential selection. The fact that choices made in sequence may not be independent requires that for the computation of the uncertainty involved in any particular choice the probabilities of the various alternatives must be determined taking into account all that has gone before. For example, it has been estimated that the average redundancy of English is approximately 50 percent. However, given the letter "q" the probability of the next letter being "u" is 1.00; therefore, the redundancy of that particular choice is 1.00. This situation, in which the probabilities involved in a given choice are dependent on the previous choices, is called a *Markoff process*. It is a term frequently encountered in the study of information theory.

In addition to the problems associated with the coding of the message, the information theory engineer has the problem of determining the channel capacity. He looks on information theory as a tool for dealing with the efficiency of coding and code transmission.

Let us consider a source capable of transmitting n symbols per second; and let us assume that this source is selecting his symbols from a set of k equally probable symbols. We can characterize this source as having a capacity for handling $(\log_2 k)n$ bits of information per second. We can perhaps simplify the definition somewhat by recognizing the fact that $\log_2 k$ represents the maximum entropy case for a given set of symbols; that is, each symbol in this set represents m bits of uncertainty, and C (the capacity of a channel for handling bits of information) is equal to m times n; $(C = mn)$.

Let us now suppose that n is a constant; if the statistical properties of the symbol set are such that the average relative entropy of the set is less than one (1), the peak of operation level of our source in bits per second handled is necessarily less than mn or rmn (where r stands for the average relative entropy of the symbol set). We can say that the maximum rate at which this source, with this symbol set, can handle information is rmn bits per second, and we redefine C as rmn.

Perhaps this would all be more meaningful with a real live example. Suppose we have a typist that is capable of typing 300 symbols per minute or 5 symbols per second, and let us further suppose that this typist is composing a message in English using the 26-letter alphabet. If those letters were equally probable there would be 4.7 bits of information associated with the selection of each symbol (1 less than in the deck of cards since 26 is exactly half of 52), and at a rate of 5 symbols per second, we would say that this typist can handle 23.5 bits per second, or 1,410 bits per minute. We would say that 23.5 bits per second is the capacity C of this typist. However, if we recognize that the letters of the English alphabet are not equally probable in "real" English, and if our typist is limited

to 5 symbols per second, the performance level measured in bits per second would necessarily be less than 23.5. If we accept Shannon's suggestion that the relative entropy of English is about .50 we could say that the average uncertainty associated with the selection of each symbol is only 2.35 bits, and with this symbol set, our 5-symbol-per-second typist could handle no more than 11.75 bits per second (i.e., if $m = 4.7$, $n = 5$, and $r = .5$, then $C = rmn = 11.75$).

Thus, given a source or channel that can handle n symbols per second: if the symbols are equally probable maximum entropy prevails, and the source can handle m bits of information per symbol or mn bits per second. We find, however, that we can remove the assumption of equal probability of symbols by multiplying by the relative entropy (r) of the symbol set and define the capacity, C, for the general case as rmn. C now accounts for the symbol transmission capacity, the size of the symbol set, and considers the distribution of the probabilities of the symbols. The above refers to the formula for the capacity of the source or channel for handling "bits" of information. We have assumed in this example that the symbol transmission rate n is a constant, but there is reason to believe that the capacity C is more stable in human communicators—that n actually decreases as rm increases.

One other concept that should be treated is the concept of *noise*. There is no man-made or natural communication system which does not have in it the potentialities for error. The electronic signal, the written word, or the spoken word all admit the possibility of foreign elements which will get in the way of the intended meaning—a cough, an illegible handwriting, random fluctuations or perturbations in the mechanical signal. These interferences are referred to as "noise." Noise in its simplest form is the addition or omission of a symbol in the communication chain which results in a discrepancy between the message transmitted and the message received (or in more human terms, the message intended and the message perceived). The fact that communication is carried on through channels in which noise is possible makes redundancy useful. In the definition of a channel-capacity redundancy appeared to be of negative value, acting as a limiting factor on the channel efficiency. However, if we consider a source or channel which is subject to error it is quite evident how redundancy can be beneficial. For example, if we have a source that tends to omit every tenth symbol, but has an average relative redundancy equal to or greater than 10 per cent, the receiver can replace the missing symbols with a rather high probability of success. The exact amount of redundancy necessary to fully compensate for a given amount and kind of noise must be determined for each new channel, source, and purpose, but perhaps the general relation which we have suggested is sufficient for this introductory paper.

By way of conclusion, let us at this point review some of the major concepts discussed and speculate about their application in the social sciences.

"Cybernetics" as a word can be compared to the term "behaviorism." It is a method of approach rather than a subject matter treated by the method. The method encompasses the fields of language, logic, mathematics, biology, psychology, physiology, anthropology, and sociology. Physiology, psychology, and the biological sciences have taken notice of cybernetics to investigate human behavior and general physiological function from the machine point of view. They have been able to do this because of a new "theory of information" which is based on a precise mathematical concept.

This new theory of information is more concerned with the technical problem of transmitting signals accurately than the semantic problem of the precision with which transmitted signals convey a desired meaning or the effectiveness with which the received meaning affects the conduct of the recipient. Its appeal is due, in part, to the fact that variables can now be quantified which up to this time had defied quantification. Therefore, to some degree it can be stated that a scientific model of communication is replacing "intuitive" or "clinical" models of communication, and predictions of human behavior are being based on "sound thinking" rather than "mere intuition."

The needs and complexities of today's societies emphasize more and more man's dependency on information. "To live effectively," as Norbert Wiener has put it, "is to live with adequate information." Information theory is an attempt to help man understand and provide "adequate information." The theory is so general that it is applicable to any type of communication—whether written letters or words, spoken words, musical notes, symphonic music, pictures, or electrical impulses. It is an imaginative theory that attempts to get at the real inner core of communication problems—"with those basic relationships which hold in general, no matter what special form the actual case may take." [15] It is a theory which bases its design on the statistical character of the source, and its aim is to compromise both rationally and profitably the excessive redundancy or bulk on the one hand and excessive sensitivity to noise on the other.

In view of this theory we should note that in the sciences, highly accurate quantitative information often brings to light important qualitative information. For example, it was the highly accurate measurements of the masses of isotopes which brought to light the mass defects, which in turn provided the starting point for the study of nuclear energies.[16]

It is an accepted fact that the theory contributes to the study of cryptography and the problems of translation from one language to another. Similarly, this theory contributes to a better understanding of computer design. Warren Weaver suggests that "this analysis has so penetratingly cleared the air that one is now, perhaps for the first time, ready for a real theory of meaning." [17]

[15] Shannon and Weaver, pp. 114–115.
[16] Stanford Goldman, *Information Theory* (New York, 1953), p. 64.
[17] Shannon and Weaver, pp. 116–117.

Can we further generalize with the concepts herein discussed? Let us take an individual who is concerned with predicting an event—any event. Isn't his ability to predict dependent on the number of possible events and his knowledge of their probabilities? And, does it not seem reasonable to say that his uncertainty is greatest when the possible events are equally probable, and least when one event has a probability of one? What about an individual who is forced to make a series of predictions, all of them under maximum uncertainty conditions—would this lead to a state of anxiety or depression? Is there an optimum level of "redundancy" under which an individual or a society functions most efficiently? Can information theory help to explain human behavior?

We think the answer to all of these questions is a qualified "yes." But, the important thing as far as rhetoric or human communication is concerned is that information theory provides a basis for a comprehensive theory of *organization*. That theory is not yet fully elaborated, but the lines of development seem clear.

Let us assume that the purpose (or function) of the "patterns of organization" consistently recommended by rhetoricians to beginning speakers is to increase the predictability (redundancy) of the message. That is, a "well-organized" message is one that, when transmitted at a normal rate, is redundant enough not to exceed the "channel capacity" of the receiver. In this sense, good spelling or articulation, acceptable grammar, and a "logical order" of ideas are all part of the same system—all indicate compliance on the part of the source with a set of restrictions which are imposed on the source. Thus, any set of restrictions on the source will serve to reduce the "freedom of choice" of the source, but only those restrictions which are familiar or can be explained to the receiver will reduce his "uncertainty." From this it follows that a message that is "organized" for one person may not be "organized" for a second person. There probably are, however, some patterns of restrictions that are more likely to produce organization for whatever audience may receive the message. Following the thread, it seems reasonable to say that titles, introductions, orienting material, subject sentences, as well as patterns of main heads serve both to restrict the production of the source and to make the audience aware of existing restrictions, either of which would tend to increase the ability of the audience to predict what the speaker is going to say next—to reduce the receiver's uncertainty about what to expect.

From this rudimentary extension of information theory it should be clear that the patterns of organization we teach may not work outside the classroom; they may not be necessary "among friends"; and there may be other ways of accomplishing the same ends that we have not considered.

It is our hope that through this paper enough recruits can be enlisted to attack the problems suggested with some probability of success.

A CONCEPTUAL MODEL FOR COMMUNICATIONS RESEARCH

Bruce H. Westley and Malcolm S. MacLean, Jr.

Communications research and theory have blossomed from a variety of disciplinary sources in recent years. People probing the communications area have here focused on theoretical issues and there on "practical" concerns. Thus, one finds today a jungle of unrelated concepts and systems of concepts on the one hand and a mass of undigested, often sterile empirical data on the other.

In this paper, we are trying to develop a single communications model which may help to order existing findings. It also may provide a system of concepts which will evoke new and interrelated research directions, compose old theoretical and disciplinary differences, and in general bring some order out of a chaotic situation. Clearly, we do not propose here a full-blown theory of mass communications, but rather a paradigm or model as a preliminary orientation to a theoretical system.

Can a simple, parsimonious model be built capable of drawing together many of the existing approaches to mass communications without serious loss in utility?
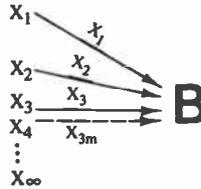
FIGURE 1. Objects of orientation $(X_1 \ldots X_\infty)$ in the sensory field of the receiver (B) are transmitted directly to him in abstracted form $(X_1 \ldots X_3)$ after a process of selection from among all Xs, such selection being based at least in part on the needs and problems of B. Some or all are transmitted in more than one sense $(X_{3m}$, for example).

FROM FACE-TO-FACE TO MASS

First, let us look at a simple act of communication. Person A transmits something about an object X to person B. Newcomb [1] has found this simple model of interpersonal communications useful in the study of roles and norms. He says that, when A communicates to B about X (other things being equal), systematic changes in the condition of the system can be predicted. For example, if B likes A (or, at least, does not dislike him), B's perception of X will be more similar to A's after than before the communicative act.

This model frees one from the limitations of either the personality or social systems as such. Can it serve as a guide to both face-to-face and mass communications? Need the extension from the simple communicative act to the mass communicative act destroy its system character?

Two basic distinctions between face-to-face and mass communications are suggested: Face-to-face communication involves more sense modalities. It also provides immediate "feedback"—that is, information from B back to A about the changed condition of B. In other words, more senses (and kinds of stimuli) can come into play in the person-person act than in any other situation. Thus, B has a "cross-modality" check. He can clear impressions he gets through one sense with those he gets through another. And A has the advantage of learning B's response almost immediately—for instance, "message received."

Mass communications, then, differ from face-to-face communications to the extent that (a) the number of modalities tends to be minimized and (b) "orientative" feedback is minimized or delayed.

Now for a look at X, which may be taken as an "object of orientation." From the standpoint of B, the world consists of a confusion of Xs. And these Xs may include As. B has within his sensory field an infinity of potential Xs. He has

[1] See Theodore M. Newcomb, "An Approach to the Study of Communicative Acts," *Psychological Review*, *60*:393-404 (Nov. 1953).
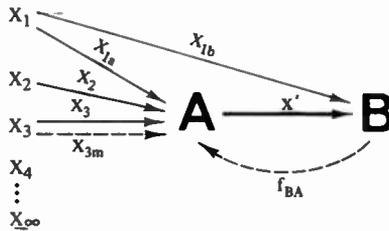
FIGURE 2. The same Xs are selected and abstracted by communicator (A) and transmitted as a message (X') to B, who may or may not have part or all of the Xs in his own sensory field (X$_{1b}$). Either purposively or non-purposively B transmits feedback (f$_{BA}$) to A.

learned that in order to maximize satisfactions and solve security problems he must orient toward Xs selectively. But the mature B, Newcomb emphasizes, does not orient toward X alone, but tends, in the presence of an A, to orient simultaneously toward both A and X. This means that he comes to orient toward an X not alone on the basis of its intrinsic capacity to provide satisfactions and help solve problems but also with respect to the relationship between A and X. This also means that A and X relate systematically to B.

Let us assume that an X is any object (or event) that has characteristics capable of being transmitted in some abstracted form.[2] Let us assume further that a system [3] has a need for transmissible messages as a means of orienting itself in its environment and as a means of securing problem solutions and need satisfactions. The significant thing is that Xs have stimulus characteristics that can be responded to in the absence of an A.

For instance, B looks out his window and sees flames in the house of his neighbor. This event as surely transmits information to him as would the shouts of his neighbor *about* the fire.

With respect to the As and Xs in his own immediate sensory field, B is capable of receiving and acting upon information thus transmitted to him and must do so if he is to maintain an adequate orientation to his immediate environment. But what of As and Xs relevant to such orientation but lying outside his immediate reach? If these are to impinge on him, there is need for another role, which we will call C.

[2] It need hardly be said that what is transmitted is not the event but an abstraction from it converted in some way to transmissible form. We are indebted to the semanticists for their emphasis on this point, particularly Wendell Johnson. See especially his "The Communication Process and General Semantic Principles," in Lyman Bryson (ed.), *The Communication of Ideas* (New York: Harper & Bros., 1948).

[3] We here choose the general term "system" because we mean that the B, or "behavioral system" in this paradigm, sometimes called the "receiver," may be an individual (personality system) or a group, large or small (social system). The assumption is that any system in this sense is motivated to seek information about its surroundings.
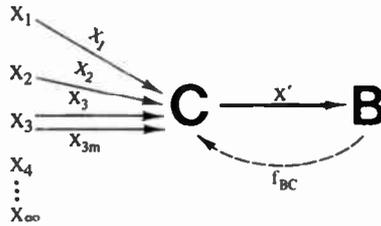
FIGURE 3. What Xs B receives may be owing to selected abstractions trans-
mitted by a non-purposive encoder (C), acting for B and thus extending B's
environment. C's selections are necessarily based in part on feedback (f_{BC}) from
B.

C is conceived of as one who can (a) select the abstractions of object X ap-
propriate to B's need satisfactions or problem solutions, (b) transform them into
some form of symbol containing meanings shared [4] with B, and finally (c) trans-
mit such symbols by means of some channel or medium to B.

The added element C will be recognized as the "gatekeeper" of Lewin [5] as
adapted to mass communications by White.[6] It is also recognizable as the "encod-
er" suggested by Bush [7] as an adaptation of the encoding process in informa-
tion theory.

It may be asked why C would choose Xs "appropriate" to the requirements
of B. The answer would appear to be that the C role can survive only to the ex-
tent that this is true. For B is still a selector among the offerings of various Cs
and this means that Cs are in effect competitors for the attention of Bs (and for
that matter competitors with As and Xs in B's immediate field). Cs therefore sur-
vive as Cs to the extent that they satisfy needs for Bs. And Bs, on the basis of the
most obvious propositions of learning theory, will tend to return to those Cs
which have provided past need satisfactions and problem solutions.

C, then, is capable of serving as an agent for B in selecting and transmitting
information about an X (or an A-X relationship [8]). He does so by means of

[4] We are once again indebted to Newcomb for his emphasis on the *shared* symbol
system. It is an advantage of a paradigm based on his *ABX* system that this concept is
derivable from the system itself without additional assumptions: communication about an
X leads to shared perceptions of it and attaches shared meanings to it.

[5] Kurt Lewin, "Psychological Ecology," in Dorwin Cartwright (ed.), *Field Theory in
Social Science* (New York: Harper & Bros., 1951).

[6] David M. White, "The 'Gate-keeper': A Study in the Selection of News," *Journalism
Quarterly, 27*:283–90 (Fall 1950).

[7] Chilton R. Bush, *The Art of News Communication* (New York: Appleton-Century-
Crofts, 1954), pp. 1–3.

[8] Following Newcomb, *op. cit.*, we treat an "opinion statement" as an A-X relationship
on the assumption that the A and the X are systematically related: the opinion attains full
meaning only in the light of who expresses it and the image of the speaker is influenced by
the nature of the opinion.
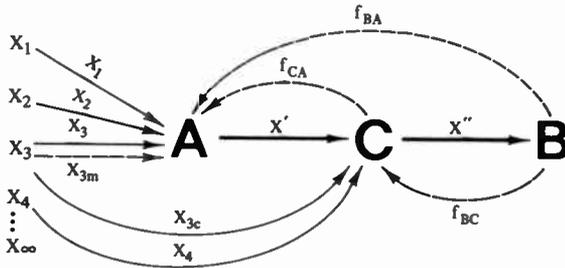
FIGURE 4. The messages C transmits to B (X'') represent his selections from both messages to him from A's (X') and C's selections and abstractions from Xs in his own sensory field (X_{3c}, X_4), which may or may not be Xs in A's field. Feedback not only moves from B to A (f_{BA}) and from B to C (f_{BC}) but also from C to A (f_{CA}). Clearly, in the mass communication situation, a large number of Cs receive from a very large number of As and transmit to a vastly larger number of Bs, who simultaneously receive from other Cs.

symbols expressing shared meanings about Xs through channels that provide connection between X and B. And he does so in circumstances where such a connection is otherwise impossible for B. Thus B has a basis for increasing his security in the larger environment and for gaining increased need satisfactions. In other words, *the effect of the addition of the C role is to provide B with a more extended environment.*

For Newcomb, A and B can only be persons. While we have tended to imply persons in these roles, it should now be made clear that we do not intend to confine the model to the level of the individual personality. The role of B, for instance, may be that of a person, or a primary group, or a total social system.

In stating that any "system" has need for transmissible messages as a means of orienting itself in its environment, it is meant that this statement be applied to a person, a primary group, or even a social system. Any of these levels can be plugged into the role of B. At the personality level, B can be the housewife, too busy to rush around the neighborhood in order to observe the details of her surroundings; in such a case the C function can be attributed to the neighborhood gossip, who observes, selects, encodes, and transmits a limited portion of all possible messages supplying the information needs of B. At something like the primary group level, one can think of the relatively isolated frontier colony, which posted sentinels as Cs to observe and report the condition of the environment by means of a special code such as a rifle shot and greeted eagerly another kind of C, the information-bearing circuit rider. At the social system level, a national state requires and maintains an elaborate network of Cs performing such special information functions as that of the diplomatic service.

It might even be possible that the model holds for even "lower" levels than that of the personality. For instance, at the physiological level, it would appear

that homeostasis [9] requires some sort of "transmission" of "information" with respect to states of parts of the body.

Not only is the model highly general with respect to levels, it is highly general with respect to kinds of messages. Messages can be seen as either *purposive* or *non-purposive*.[10] Other models have tended to obscure one or the other.

"PURPOSIVE" OR "NON-PURPOSIVE"?

A purposive message is one A originates for the purpose of modifying B's perception of an X. A non-purposive message is one which is transmitted to B directly or by means of a C and in the absence of any communicator's intent to influence him. The absence of a communicator's intent to influence B transforms his act into an X. When a person says something he hopes will reach another person's ears, he is an A; but if he says it without such intent and it nevertheless is transmitted to B, his act must be conceived of as an X, the selection and transmission having been performed by a C. The reasons we consider this distinction to be crucial for mass communications theory will be discussed below.

Messages are transmitted in codes (symbol systems). But this model is by no means limited to the most obvious ones—linguistic systems. In fact, as Newcomb has already emphasized, the crucial characteristic is the shared meanings associated with symbols. Such symbols can take virtually any form, so long as and to the extent that there exist shared meanings and that they are transmissible. Such shared meanings surrounding symbols can be either *affective* or *cognitive*. Language has both affective and cognitive elements. Poetry, for instance, emphasizes the former. This emphasis is, of course, characteristic of all the arts. For instance, modern artist A in communicating with a series of Bs casts his message in a symbol system which is shared, even though with only a few of them; those Bs who share it or part of it will attain satisfaction from the communication of an affective state; those who cannot decode the message but attempt

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[9] See W. B. Cannon, *The Wisdom of the Body* (New York: Norton, 1932).

[10] The original articles referred to "purposive" and "fortuitous" messages (and feedback). Perhaps the latter term was unfortunate, for it appears to have been generally misunderstood. Of course we do not mean to say "chance" messages, for messages are *selected* (by As, Bs, and Cs) on the basis of their utility in providing need satisfactions and problem solutions. It is the occurrence of the events (Xs) that is "fortuitous." We also wish to emphasize that it is in the "role prescriptions," not in the actual performance, that the distinction is made between the purposive or "advocacy" characteristic of the A role and the non-purposive or "gate-keeper" characteristic of the C role. A reporter may consciously or unconsciously be an advocate in his gate-keeper job; we treat this situation as a discrepancy between his "role prescriptions" and his actual "role behaviors," and treat the size of this discrepancy as an empirical question. For a helpful discussion of these terms, see Theodore M. Newcomb, *Social Psychology*, especially Chapter 8, "Social Norms and Common Attitudes," pp. 264–97.

to do so will probably be frustrated in the attempt and express hostility toward the message,[11] or the communicator, or conceivably even the gatekeeper.

The example above leads into further illustration of how the model deals with "special publics." These are illustrated by the immense segment of the media consisting of trade publications, scholarly journals, hobby and craft media, house organs, and the like. These are often defined out of the area of mass communications, usually on the grounds of audience size; and this in spite of the fact that some of these special interest publications attain circulations in the millions. The fact would seem to be that these media shade off from the specificity of the *Turkey Grower's Gazette* to the generality of *Holiday*, suggesting that decisions as to what is "mass" and what is not mass must necessarily be arbitrary.

The present model requires no such distinction. Our *B*s vary in the degree to which they share common problems. Common problems imply the necessity of attaining communication with common *X*s. Media serving to bring such *X*s to such *B*s arise out of the perceptions by *C*s of the existence of just such a need. Special symbol systems are developed to maximize transmission.

It will be noted that we have consistently referred to both "need satisfactions" and "problem solutions." These concepts relate directly to the "immediate" and "delayed" rewards of Schramm [12] which seem to us to be provocative and potentially fruitful. Building on the two-factor learning theory of Mowrer,[13] Schramm proposed a "reader reward" basis for characterizing the content of news stories. The correspondence is, of course, between his "immediate reward" and our "need satisfactions" and between his "delayed reward" and our "problem solutions."

FEEDBACK

Another concept crucial to the model is that of "feedback." In the first place it should be clear from the foregoing that it is feedback that assures the system character of the *ABX* (or *ABCX*) relationship. If *A* is to utilize his experience in influencing *B*, he must have information about any changes in the condition of *B*

[11] This statement is of course not derivable from the paradigm (and the reader is reminded that this is a paradigm and not a full-blown theory). But because the *B* system is *seeking* problem solutions and need satisfactions there are grounds in the literature of psychology for assuming that when his search is frustrated, aggressive behavior may follow. See Neal E. Miller, *et al.*, "The Frustration-Aggression Hypothesis," *Psychological Review*, 48:337–42 (1941).

[12] Wilbur Schramm, "The Nature of News," *Journalism Quarterly*, 26:259–69 (September 1949).

[13] O. H. Mowrer, *Learning Theory and Personality Dynamics* (New York: Ronald Press, 1950), pp. 222–317.

attributable to his communications. C is equally concerned with effects on B if he is to make realistic adjustments in his role as B's "agent." Such As as advertisers facilitate feedback by means of elaborate market research; public relations men obtain feedback by means of public-opinion polls and other devices for determining the effects of their messages. Such Cs as newspaper publishers sponsor readership surveys and, more recently, reader motivation studies to estimate and predict reader response. Radio's concern with "fan mail" and popularity ratings is well known.

Although feedback originates with B under most circumstances, it need not be assumed that B is necessarily trying to communicate back to C or A. When he does try to do so, we may think of this as *purposive* feedback. This is the case when an angry reader writes a letter "straightening out" the editor on some favorite issue. But there are also many ways B can feed back without intending to. These we will call *non-purposive* feedback. When a television fan decides to try a well-advertised detergent, his purchase becomes part of the data of a market survey, even though he may not have intended to let the sponsor know he had won a convert.

OTHER MODELS

In the final analysis the worth of such a model as this lies in its heuristic value. In view of the fact that several other models already exist in this field, it is reasonable to ask why another is necessary. A brief look at some others may be in order.[14]

Perhaps the most pervasive of existing "models" is that of Lasswell: "*Who* says *what* through *what channels* to *whom* with *what effect*." [15] The difficulty here is that the model seems to demand the presence of a communicator—the *who*—and to imply that his communication is a purposive one. It is no accident that our model has included the non-purposive case, transmitting Xs to Bs by the way of Cs in the total absence of As. The fortuitous origination of a great deal of the news material transmitted in all media seems to demand a place in the model. There is also an unidirectional implication in the Lasswellian formulation that ignores feedback phenomena.

[14] Several other general models or partial theories of the total mass communication process have appeared recently. They include Franklin Fearing, "Toward a Psychological Theory of Human Communication," *Journal of Personality*, 22:71–88 (September 1953); Wilbur Schramm, "How Communication Works," in Schramm (ed.), *The Process and Effects of Mass Communications*; and George Gerbner, "Toward a General Model of Communication," *Audio-Visual Communication Review*, 4:171–99 (Summer 1956).

[15] Harold D. Lasswell, "The Structure and Function of Communication in Society," in Bryson, *op. cit.*, pp. 37–51.

The information theory-cybernetics paradigm [16] has excited some interesting theoretical contributions [17] but would appear to have certain drawbacks. It, too, appears to require the presence of a communicator, although not necessarily a purposive one. In addition it poses all the problems of a "borrowed" model. Taylor's use of the redundancy concept [18]—would appear to be an example of an exact mapping from mass communications phenomena to an element in the model. But such precise correspondences appear to be rare, and mappings become contrived and tenuous. The model strains common knowledge, for instance, in assuming perfect correspondence of symbol systems encoded and decoded.[19]

SUMMARY

A conceptual model of the total communication process has been presented in the belief that such a model will prove useful in ordering existing data in mass communications research, point to areas of strength and weakness in our knowledge, and stimulate further efforts. The model is intended to be sufficiently general to treat all kinds of human communication from two-person face-to-face interaction to international and intercultural communications. It assumes that a minimum number of roles and processes are needed in any general theory of communications and attempts to isolate and tentatively define them. It must not be viewed as a theory but as a preliminary step to the construction of a general theory.

The principal elements in the model are these:

As (Advocacy roles). This is what is usually meant by "the communicator"—a personality or social system engaged in selecting and transmitting messages *purposively.*

[16] See Claude E. Shannon and Warren Weaver, *The Mathematical Theory of Communication* (Urbana: University of Illinois Press, 1949).

[17] See especially Bush, *op. cit.,* and Wilbur Schramm, "Information Theory and Mass Communication," *Journalism Quarterly, 32:*131–46 (Spring 1955).

[18] Wilson L. Taylor, "'Cloze Procedure': A New Tool for Measuring Readability," *Journalism Quarterly, 30:*415–33 (Fall 1953).

[19] In information theory, the "ensembles" for purposes of encoding and decoding are equivalent. There is no provision for decoding errors as such; only "noise" in the channel can produce encoder-decoder disagreement. Noise is defined as random events. Various writers, including Bush, *op. cit.,* have suggested distinguishing "channel noise" from "semantic noise," the latter being defined more or less as decoding errors attributable to ensemble differences at the encoding and decoding stages. The distinction is important, of course, but this would appear to be a case of bending the model to satisfy common sense. It is not easy to see how the mathematical relations in information theory could survive the incorporation of this new concept; such noise must surely be systematic and not random, for instance. For a more technical treatment of essentially the same point, see Lee J. Cronbach, "On the Non-Rational Application of Information Measures in Psychology," in Henry Quastler (ed.), *Information Theory in Psychology: Problems and Methods,* pp. 14–25.

*B*s. (Behavioral system roles). This is what is usually meant by "the receiver," "the public," etc.—a personality or social system requiring and using communications about the condition of its environment for the satisfaction of its needs and solution of its problems.

*C*s. (Channel roles). Often confounded with *A*s, *C*s serve as the agents of *B*s in selecting and transmitting non-purposively the information *B*s require, especially when the information is beyond the immediate reach of *B*.

X. The totality of objects and events "out there." X^1 is these objects and events as abstracted into transmissible form: "*messages*" about *X*s and *A-X* relationships (such as "opinions").

Channels. The means by which *X*s are moved by way of *A*s and/or *C*s to *B*s. Channels include "gates" manned by *C*s who in various ways alter messages.

Encoding. The process by which *A*s and *C*s transform *X*s into X^1s. *Decoding* is the process by which *B*s interiorize messages.

Feedback. The means by which *A*s and *C*s obtain information about the effects of messages on *B*s.

A TRANSACTIONAL MODEL OF COMMUNICATION

Dean C. Barnlund

Men have advanced from myth-making to mathematical equation in search of better ways of communicating their understanding of physical and social realities. For centuries investigators were content to rely upon ordinary language as a means of conceptualizing their hunches about reality. Not long ago the physical scientists became disenchanted with words as a vehicle for thought and turned to the language of mathematics; today, behavioral scientists reflect the same dissatisfaction and search for more suitable symbol systems for coping with their emerging problems.

The reason for this widespread discontent is not difficult to locate. Any hypothetical statement in sentence form must fit the categories of language and obey the rules of grammar. This is no handicap as long as the investigator deals with situations in which the elements are discrete and more or less constant, or where their influence upon each other is a linear or additive one. Descriptive statements about such events can be a reliable way of postulating what is known, for lan-

guage is a splendid instrument for handling stable elements and sequential or ad-
ditive relationships.

There is serious doubt, however, whether or not the simplistic explanations
demanded by language serve the ends of research sufficiently well if more dy-
namic forces and more complicated relationships are involved. This seems to be
the case today. Both the problems that interest the behavioral scientist, as well as
the perspective from which they are attacked, have changed radically. According
to Peter Drucker there has been a quiet revolution in scientific thought during
the past few decades. "An intelligent and well educated man of the first 'modern'
generation—that of Newton, Hobbes, and Locke—might still have been able to
understand and make himself understood up to World War II. But it is unlikely
that he could still communicate with the world of today, only fifteen years
later." [1] The contemporary scientific world has quietly replaced the two related
premises of the Cartesian, or mechanistic, view of the universe—that the whole is
the sum of its parts and causality the *only* unifying order—with a world view
that emphasizes process. This has brought about a theoretical revolution of such
proportion that "virtually every one of our disciplines now relies on conceptions
which are incompatible with the Cartesian axiom, and the world view we once
derived from it." [2] Appeals for fresh approaches to the problems of matter, life
and mind are no longer the exception in scientific journals. [3]

One evidence of the changing perspective is seen in the new vocabulary of
science. To convey their discoveries biologists resort to neologisms like ecology
and homeostasis; psychologists analyze human personality in terms of drives and
syndromes; rhetoricians find themselves talking about communication and mean-
ing. All are terms that reject an atomistic or elementalistic approach in favor of
a systemic or holistic one.

It is the whole of speech, including not only the words left unsaid but the whole atmosphere
in which words are said and heard, that "communicates." One must not only know the
whole of the "message," one must also be able to relate it to the pattern of behavior,
personality, situation, and even culture with which it is surrounded. [4]

Another sign of the search for new modes of attack on the problems of mat-
ter and mind can be found in experimentation with other modes of conceptuali-
zation. One of these innovations is the scientific model. As a theoretical tool the
model is not an entirely unique instrument in that many theoretical statements
can be translated into models, and some models, in turn, may be restated as theo-

[1] Peter F. Drucker, "The New Philosophy Comes to Life," *Harper's Magazine* (August,
1957), p. 36.

[2] *Ibid.*, p. 37.

[3] See L. L. Whyte, *Accent on Form* (Harper, 1954) and J. F. T. Bugental, "Humanistic
Psychology: A New Break-Through," *American Psychologist* (September, 1963).

[4] Drucker, *op. cit.*

ries. Yet, while admitting this, the scientific model remains one of the more promising ways of treating the complexities of human behavior and a method of representing its inner dynamics that deserves careful study.

THE NATURE OF MODELS

A model is an attempt to recreate in physical or symbolic form the relationships alleged to exist among the objects or forces being investigated. It may consist of a complex arrangement of wires and relays built by a neurologist to reproduce the reflex loops of the nervous system, or an elaborate structure of sticks and wooden balls arranged by a chemist to duplicate the DNA molecule. Although models are as diverse as the questions men phrase in their search for knowledge, they can be classified broadly as to purpose and material.

Structural models are designed to show the formal properties of any event or object. They serve to identify the number, size and arrangement of the discrete parts of a system. A miniature solar system, charts indicating levels of management, diagrams of the components of an electronic computer illustrate the formal model. In other cases the model is designed to replicate function. The designer attempts to represent the forces that comprise the system and establish the direction, volatility, and relation of their influence. Functionally isomorphic models need not resemble the event they simulate, but they must operate in essentially faithful ways. Walter's "tortoise" and Ashby's "homeostat" do not look like the cerebral cortex, but each duplicates some important function of the human brain.

Models also differ in the material of which they are made. Some are built of wood or steel or papier-mâché, and are constructed so that they can be manipulated or dismantled according to the whim of the investigator. Tangible models include prototypes of the human skeleton, replicas of assembly lines, clay mockups of new pieces of equipment. Models may also be symbolic in character, consisting only of lines or shapes on a piece of paper. Lewin's vector drawings and Korzybski's structural differential are examples of symbolic models.

Our interest lies in the symbolic rather than physical model, and with the functional rather than structural model. It may become possible for future investigators to create mathematical models of human communication rivaling those of the physical scientists, but in the absence of sufficiently discrete variables and with current complications in measurement of these variables, this hope seems premature. The diagrammatic model seems best suited to accommodating our current level of knowledge about communication and, at the same time, providing an improved mode of conceptualizing over that secured through verbal statements alone.

VALUES AND LIMITATIONS

Several features of the diagrammatic model recommend it as a means of "pictur-ing" the communication process. The complexity of communication has long been regarded as the major impediment to the study of human speech. Yet this obstacle may be unduly exaggerated, with much of the pessimism deriving from an outmoded strategy. When social scientists try to isolate and order all of the elements of a complex event—that is, when they approach such a system analyti-cally—the results are often unmanageable. As Ashby has observed, "If we take such a system to pieces, we find we cannot reassemble it!" [5] The temptation, then, is to junk the whole idea and fall back upon over-simplified aphorisms and maxims. We may, as Grey Walter suggests, be able to do better than that.

The number of observed facts is the exponent of the number of possible hypotheses to relate them. When there are few facts and many impossible connections the subject may be understood without great difficulty, but when there are many facts from diverse sources and nothing can be assumed impossible special tactics must be used to permit an ordinary mind to see the wood rather than the trees. Perhaps the simplest and most agreeable device in such a situation is to construct models, on paper or on metal, in order to reproduce the main features of the system under observation. [6]

One advantage of the model, then, is the ease with which it handles a multitude of variables and relates their effects upon each other in highly complicated ways, thus preserving the integrity of events under study.

To this must be added the heuristic or clarifying advantage of the model. The designer of a model is forced to identify variables and relate them with a precision that is impossible for the writer to achieve because of the stylistic de-mands of effective writing. A diagram or formula can portray at a single glance, and with great transparency, the assumptions and properties of a new theoretical position, thus stimulating the study of alternative approaches. [7]

Closely associated with the clarity of the symbolic model is its critical vul-nerability. It simplifies the job of the critic who needs to identify innovation, who must discover the strengths, ambiguities and omissions of new conceptual positions. More models of human behavior might be produced if models were not

[5] W. Ross Ashby, "The Effects of Experiences on a Determinate Dynamic System," *Behavioral Science* (January, 1956), p. 36.

[6] Grey Walter, "Theoretical Properties of Diffuse Projection Systems in Relation to Behaviour and Consciousness," in E. H. Adrian (Ed.), *Brain Mechanisms and Consciousness* (Thomas, 1954), p. 367.

[7] Considerable light is thrown upon communication theories of the past by making this sort of translation from text to model although a critical review of traditional theories of communication is beyond the limits of this paper.

so critically vulnerable, for even the architect cannot overlook the deficiencies of his own model. This, of course, is precisely what recommends it as a means of theoretical communication.

Not to be overlooked in these days of editorial compression is the compact nature of a model. Short of a mathematical equation, it is the most cryptic form in which a theoretical position can be communicated. While verbal description must supplement most models, once understood, the model is usually sufficient in itself to serve as a framework for empirical or experimental research.

Yet a model is no more than an analogy. As such it is subject to all the risks as well as opportunities latent in any comparison. Factors that appear in real life may be overlooked or distorted in the model. The relationships claimed may not parallel the dynamics of the observed event. The model may be oversimplified or overelaborated; both errors can be contained within the same model. Some model-makers are carried away by what are essentially aesthetic, rather than empirical, considerations. And there is always the danger of becoming so entranced with the construction of models that the arduous search for new and irreconcilable data is neglected. In short, no model can rise above the empirical data and theoretical assumptions on which it rests.[8]

The construction of any model proceeds in a circuitous way. One postulates what one can verbally, then translates these assumptions into diagrammatic form. This, in turn, reveals omissions and distortions that must be eliminated by modifying assumptions, making further changes in the drawings, and so on. The following postulates, constituting the theoretical foundation of the proposed models can be derived from them, but it may be helpful to state them verbally and see to what extent they are realized within the diagrams that follow.

COMMUNICATION POSTULATES [9]

COMMUNICATION DESCRIBES THE EVOLUTION OF MEANING. While we are born into and inhabit a world without meaning, we rapidly invest it with significance and order. That life becomes intelligible to us—full of beauty or ugliness, hope or despair—is because it is assigned that significance by the experiencing being. Sensations do not come to us all sorted and labeled, as if we were visitors in a vast but ordered museum. Each, instead, is his own curator. We learn to look with a selective eye, to classify, to assign significance.

The word "communication" stands for those acts in which meaning develops

[8] See Alphonse Chapanis, "Men, Machines, and Models," *American Psychologist* (March, 1961).

[9] Some of the material in this section is drawn from an earlier paper. See Dean C. Barnlund, "Toward a Meaning-Centered Philosophy of Communication," *Journal of Communication* (December, 1962).

within human beings as neuro-motor responses are acquired or modified. It arises out of the need to reduce uncertainty, to act effectively, to defend or strengthen the ego. Its aim is to increase the number and consistency of meanings within the limits set by attitude and action patterns that have proven successful in the past, emerging needs and drives, and the demands of the physical and social setting of the moment. It is not a reaction to something, nor an interaction with something, but a transaction in which man invents and attributes meanings to realize his purposes.[10] It should be stressed that meaning is something "invented," "assigned," "given," rather than something "received." The highly idiosyncratic character of our meanings is richly documented in studies of perception, particularly in the interpretation of projective tests. Flags, crowns, crosses and traffic signals do not contain meanings; they have meanings thrust upon them.[11] Our physical and social environment, including the messages to which we attend, can be regarded only as placing some sort of upper limit upon the number and diversity of meanings we invent.

It is clear that communication, in this sense, occurs in a variety of settings traditionally neglected by students of communication. Meanings may be generated while a man stands alone on a mountain trail or sits in the privacy of his study speculating about some internal doubt. Meanings are invented also in countless social situations in which men talk with those who share or dispute their purposes. But no matter what the context, it is the production of meaning, rather than the production of messages that identifies communication.

COMMUNICATION IS DYNAMIC. The tendency to treat communication as a thing, a static entity, rather than a dynamic process occurring within the interpreter, seems to be an assumptive error of long standing and one that has seriously hampered the investigation of human communication. As Walter Coutu has stated so succinctly, "Since meaning is not an entity, it has no locus; it is something that occurs rather than exists. . . . Despite our Aristotelian thought forms, nothing in the universe 'has' meaning, but anything may become a stimulus to evoke meaning by way of inducing the percipient to give self instructions on how to behave in relation to it." [12]

Both entity and process are circumstantial, that is, contingent upon the surrounding milieu, but an entity is at the mercy of external conditions while a process changes from moment to moment according to its own internal law or principle. The latter condition, according to Kenneth Boulding, clearly characterizes

[10] The most recent writing on transactional psychology is found in Franklin Kilpatrick (Ed.), *Explorations in Transactional Psychology* (New York University Press, 1961).

[11] This may explain why information theory which has so much to contribute to the study of message transmission has so little relevance for the study of meaning. The analysis of message "bits" neglects the semantic import of the message units which must be the target of the communicologist.

[12] Walter Coutu, "An Operational Definition of Meaning," *Quarterly Journal of Speech* (February, 1962), p. 64.

man as a communicator. "The accumulation of knowledge is not merely the difference between messages taken in and messages given out. It is not like a reservoir; it is rather an organization which grows through an active internal organizing principle much as the gene is a principle or entity organizing the growth of bodily structure." [13] This "internal organizing principle" in the case of man is commonly referred to as abstracting, a capacity or potentiality shared with all living organisms.

The process of abstracting is set in motion by a perceptual discrimination of some sort, the detecting of a difference between ourselves and others, between figures and ground, between phenomena that are similar or contiguous. It is carried on by focusing attention on arbitrarily selected cues, by grouping and assigning potency to these cues, and by linking them with the whole array of past experience. Although some aspects of perceptual set are currently understood, the dynamics of the internal manipulation of cues and the attribution of meaning to them is still largely unfathomed.

COMMUNICATION IS CONTINUOUS. Communication with the physical world, or with other human beings, is not a thing, nor even a discrete act, but a continuing condition of life, a process that ebbs and flows with changes in the environment and fluctuations in our needs. "It is only the imperfection of the fit, the difference between organism and environment, coupled with the perpetual tendency to improve the fit, that allows the working parts to work and makes them continue to work." [14]

This process has no beginning nor end, even in sleep or under conditions of sensory deprivation, for man is a homeostatic rather than static mechanism.

The brain works as naturally as the kidneys and the blood-vessels. It is not dormant just because there is no conscious purpose to be served at the moment. If it were, indeed, a vast and intricate telephone exchange, then it should be quiescent when the rest of the organism sleeps. . . . Instead of that, it goes right on manufacturing ideas—streams and deluges of ideas, that the sleeper is not using to *think* with about anything. But the brain is following its own law; it is actively translating experiences into symbols, in fulfillment of a basic need to do so. It carries on a constant process of ideation. [15]

The dynamic equilibrium of a mobile by Alexander Calder, in which the movement of each pendant upsets the balance among all the others until a new equilibrium is achieved, is an artistic expression of the "internal organizing principle" of which Boulding writes. Each new meaning derived from communication is both relieving and disturbing to man, leading to a ceaseless search for new ways of coping with his surroundings. Only in the organically deficient or the functionally disturbed, where rigidities in perceiving and abstracting are ex-

[13] Kenneth Boulding, *The Image* (University of Michigan Press, 1961), p. 18.

[14] Whyte, *op. cit.*, p. 120.

[15] Susanne Langer, *Philosophy in a New Key* (Mentor, 1942), p. 33.

treme, is this process retarded or temporarily arrested.[16] For most, communication begins at birth or before and continues without serious interruption until death.

COMMUNICATION IS CIRCULAR. Defining communication as a continuous process of evolving meanings leaves the communicologist in the position of facing an altogether new problem with an outmoded vocabulary and strategy. The usual starting point in the analysis of any communicative act is to identify the critical elements. Normally this leads to categorization of a "sender," a "message," and a "receiver." Having defined the problem in structural terms, the investigator is then obliged to continue his analysis within the framework of this assumption. It is obvious, largely because grammar suggests it, that the elements must fall into some sort of pattern: A, then B, then C. It is not long before the conclusion is drawn that these entities not only occur in sequence, but that they are causally related. A sender causes, by means of a message, certain effects in a receiver. Communication originates with the speaker, it terminates in a listener.[17]

No matter how appealing this may appear in its clarity and simplicity, it generates more problems than it solves. A structural approach, with its static elements and terminal implications, does not fit a process like communication. "There is," according to Arthur Clarke, "no demarcation of a boundary between the parts in a communication process." [18] To erect such "lines of demarcation" cannot help but obscure the circular character of communication.[19]

New conceptual opportunities may arise if functional terms, such as sending and receiving—or better, encoding and decoding—are substituted for the former labels. It is clear, then, that these are operations and that, as such, they may as-

[16] The tendency to talk about abstracting in static rather than dynamic terms is found even in some psychiatric literature where trauma are sometimes regarded as psychological injuries with a well-defined locus in childhood. It seems plausible that many perfectly ordinary events actually become traumatized by continual abstraction of these episodes in a nervous system with narrow or illusory assumptions until the original event becomes so shocking in its meaning that it can no longer be admitted to consciousness. Indeed, if experiences did not continue to be processed in the nervous system, there would be no possibility of cure for the disturbed individual.

[17] Recently, through the influence of writings in cybernetics, another causal link, the reverse of the above, has been added to include the feedback of information in the opposite direction. This addition, while compensating for some of the naïveté of the earlier explanation, has not produced a radical change in the mode of analysis employed in studying human interaction.

[18] Arthur Clarke, "Messages from the Invisible Universe," *New York Times Magazine* (November 30, 1958), p. 34.

[19] Structural terminology is not outmoded, of course, when structural aspects of communication are studied. The earlier terminology would seem to continue to be of value in research on public address where there is considerable stability in the roles of speaker and audience.

sume a variety of patterns: symbolizing and interpreting may go on in a single person when he is alone; meanings may develop in two or more communicants simultaneously; messages, in the absence of either a source or receiver, may generate effects; meanings continue to flourish or deteriorate long after they are initiated, and so on.[20] There is a temptation to borrow the term "transceiver" from the engineers, for it summarizes the way encoding and decoding functions may be accommodated within a single organism. Communication seems more accurately described as a circular process in which the words "sender" and "receiver," when they have to be used at all, serve only to fix the point of view of the analyst who uses them.[21]

A structural approach seems ill-adapted to handling the internal dynamics of this complex process. If the actual variables were discrete and independent of one another, complexity in their relations would not be a deterrent, for the functional formula, $Y = f (a, b, c, \ldots)$, is available for handling such data. But if one has to cope with variables that are not only unstable, but that are interdependent as well, new modes of analysis are needed. Linear causality, with its sharp demarcation of independent and dependent variables, no longer gives sensible structure to observation.

We now merely note that methodologically the complexity that is added by reciprocal control may be denoted by the loss of a clear separation between independent and dependent variables. Each subject's behavior is at the same time a response to a past behavior of the other and a stimulus to a future behavior of the other; each behavior is in part dependent variable and in part independent variable; in no clear sense is it properly either of them.[22]

When signals must be treated simultaneously as both cause and effect, or where the communicative variables have reciprocating influences, a change in approach is necessary. A kind of "interdependent functionalism" might be proposed by tampering with the functional formula so that each variable becomes a function of all other variables. For example, $Y = f [a = f (b, c, \ldots), b = f (a, c, \ldots), c = f (a, b, \ldots)]$. But the statistical complications associated with such an elaboration of the formula when combined with the difficulties in measuring communication variables underscore the need for alternative approaches. Diagrammatic rendering of the interdependence and circularity of encoding and decoding processes may constitute such an alternative.

[20] See John Newman, "Communication: A Dyadic Postulation," *Journal of Communication* (June, 1959).

[21] A striking parallel is found in research on leadership in face-to-face groups. As long as investigators phrased their problems in terms of leaders and followers, that is in terms of persons, little progress was made during several decades of research. As soon as leadership was defined operationally, in terms of functions, important advances were made at once in describing various patterns of influence.

[22] John Thibaut and Harold Kelley, *The Social Psychology of Groups* (Wiley, 1959), p. 2.

COMMUNICATION IS UNREPEATABLE.   The distinction being suggested here is between systems that are deterministic and mechanical, and those that are spontaneous and discretionary. In the former, the output of the system can be predicted as soon as the input is identified, for the system obeys a rigid logic that was built into it and which it is incapable of revising in its own interests. The system operates with minimal degrees of freedom. Repeat the input conditions and obtain identity of output. In an information-handling system of this type one can speak of the "same message" producing the "same effect," for the system does not have autonomous control of its own programming.

In the case of spontaneous systems, one that more accurately fits the communication of men, the system is governed by internal organizing principles which are themselves subject to change. There are substantial degrees of freedom which give the system a certain element of caprice, otherwise circularity would imply repeatability. In a spontaneous organism it is dangerous to assume that identical inputs will lead to the same output because the system has some control over its own internal design. One may start an engine over and over again, or return to the same office repeatedly. But one cannot expect the same message to generate identical meanings for all men, or even for a single man on different occasions. The words of a message, even when faithfully repeated upon request, may provoke new insight, increase hostility, or generate boredom.

This is not to say that man never behaves in the same way on different occasions. Carried to an extreme the principle of unrepeatability would require totally erratic responses. This, in turn, would make a science of man virtually impossible. People do display consistency in behavior, the degree of the consistency reflecting the rigidity of assumptions required by the personality to maintain itself in encounters with reality. But, while behavior patterns may reappear from time to time, normally they do not repeat themselves precisely, nor are they triggered by identical environmental cues. Perhaps more central to developing a science of "healthy human behavior" is the recognition that modification rather than repeatability is inherent in the human organism and that the exploitation of this capacity of the personality may be an important measure of its performance.

COMMUNICATION IS IRREVERSIBLE.   Even in those systems that are autonomous there is the question of direction. Some processes are not only repeatable, but reversible as well. Heat will convert a block of ice into water, and finally into steam; a drop in temperature will liquefy the gas, and return it to a solid state. Transposing the terminals on a storage battery can reverse the direction of chemical changes within. Reversible systems can return to earlier states by simply retracing the steps by which they reached their present condition. A number of bodily functions such as breathing involve reversible processes.

Some systems, however, can only go forward from one state to another, from one equilibrium to a new equilibrium, never returning to their original state. "The basic cycles of nutrition, waking, and sleeping, and work and play

must be maintained but they should be complemented by an adequate degree of one-way processes: of growth, reproduction, learning, and constructive or creative activities. With every breath, in and out, we grow older, but this can be complemented by a small residue of cumulative achievement." [23] One can speak of the human skeleton as evolving from infancy to adulthood without the possibility of returning to earlier developmental stages. The same holds for human experiences. Our communication with ourselves and the world about us flows forward inexorably. Recent investigations of psychical phenomena through neurosurgery seem to bear this out.

Let me describe what seems to happen by means of a parable: Among millions and millions of nerve cells that clothe certain parts of the temporal lobes on each side, there runs a thread. It is the thread of time, the thread that runs through each succeeding wakeful hour of the individual's past life . . . Time's strip of film runs forward, never backward, even when resurrected from the past. It seems to proceed again at time's own unchanged pace.[24]

Here a figurative phrase, the "stream of consciousness," attains literal truth. Human experience flows, as a stream, in a single direction leaving behind it a permanent record of man's communicative experience. Interruptions may mar the record as in the case of amnesia, or injury reduce its efficiency as in aphasia, but there is no "going back." One cannot start a man thinking, damage his self-respect or threaten his security, and then erase the effects and "begin again."

COMMUNICATION IS COMPLEX. Enough has already been said to suggest the complexity of human communication. If any doubt remains after considering the continuous, interdependent, irreversible and sometimes elusive functions of encoding and decoding, one has only to add the vast array of communicative purposes, social settings, and message forms, at the disposal of any communicant. There is communication with self, with the physical environment; there is communication with others in face-to-face, organizational and societal contexts. The drives that require communication for their fulfillment stretch all the way from overcoming physical and psychological isolation through the resolution of differences, to catharsis and personality reorganization. In addition, the evolution of meaning is a process that goes forward at many levels of the personality, sometimes conscious, other times preconscious or subconscious; there are even channels of "crosstalk" linking these levels that still baffle and elude us. It is a rare message that does not contain both manifest and latent meanings, that does not illumine internal states as well as external realities. And the verbal symbols of a message are often played off against a backdrop of significant gestures and nonverbal accompaniments that may contradict, elaborate, obscure or reinforce

[23] Whyte, *op. cit.*, p. 117.

[24] Wilder Penfield, "The Permanent Record of the Stream of Consciousness," *Proceedings of the 14th International Congress of Psychology* (June, 1954), pp. 67–68.

them. The study of man's communication with self and others seems both compli-
cated and, at the same time, central to the full appreciation of what it is to be a
man.[25]

A PILOT MODEL

A pilot study is an "experimental experiment" in which an investigator attempts
a gross manipulation of his variables to determine the feasibility of his study,
clarify his assumptions and refine his measuring instruments. The drawings that
follow are "pilot models" in the same spirit, for they are preliminary experiments
in diagramming self-to-environment, self-to-self and self-to-other communication.

INTRA-PERSONAL COMMUNICATION

It may help to explain the diagrams that follow if the abstract elements and rela-
tions in the models are given concrete illustration by using a hypothetical case.
Let us assume a simple communicative setting. In Figure 1, a person (P_1), let us
say a Mr. A, sits alone in the reception room of a clinic waiting to see his doctor.
As a communication system Mr. A decodes (D), or assigns meaning to the var-
ious cues available in his perceptual field by transforming sensory discrimina-
tions into neuro-muscular sets (E) so that they are manifest to others in the form
of verbal and nonverbal cues. Evidence is not available which will permit us to
establish if encoding and decoding are separate functions of the organism,
successive phases of a single on-going process, or the same operation viewed
from opposite ends of the system, but it is reasonable to assume until we have
solid proof that they are closely articulated and interdependent processes. The
spiral line connecting encoding and decoding processes is used to give diagram-
matic representation to the continuous, unrepeatable and irreversible nature of
communication that was postulated earlier.

The meanings presented in Mr. A at any given moment will be a result of
his alertness to, and detection of, objects and circumstances in his environment.

[25] Man has been variously described as a symbolizer, abstracter, culture-creator, time-
binder, and communicator. More recently system theorists, reflecting current interests in cyber-
netics and information theory, have characterized him as an "open system." The parallel
between the communication postulates above and the criteria for identifying open systems is
striking. Allport specifies that in such systems there is "intake and output of matter and
energy," "achievement and maintenance of homeostatic states," an "increase in complexity and
differentiation of parts," and "there is more than mere intake and output of matter and energy;
there is extensive transactional commerce with the environment." Gordon Allport, "The
Open System in Personality Theory," *Journal of Abnormal and Social Psychology* (Volume
61, 1960), pp. 303–306.
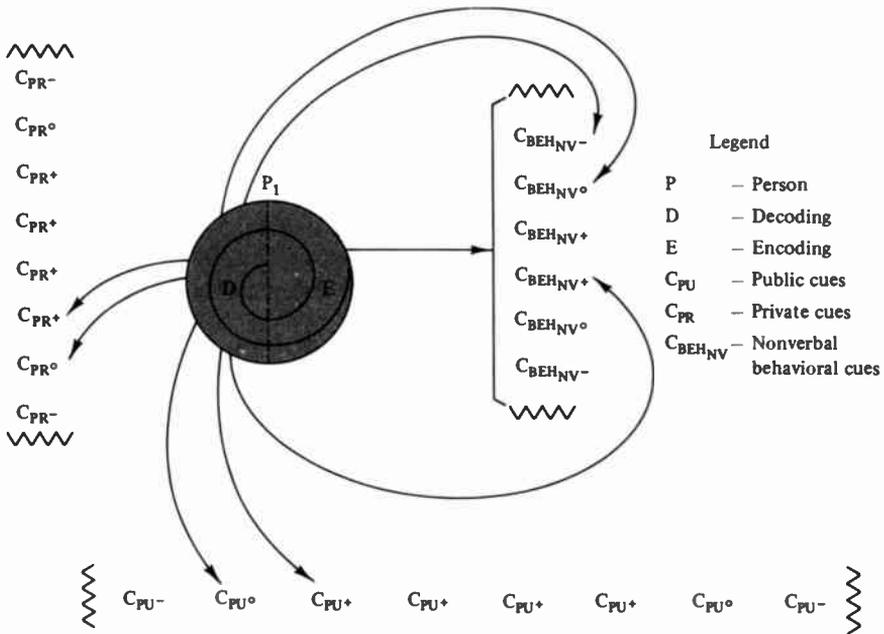
FIGURE 1.

The lines terminating in arrows on Figure 1 can be used to indicate either the different stimuli that come into focus as Mr. A's attention shifts from moment to moment, or that a single "experience" may be a mosaic of many simultaneous perceptions. The direction of the arrows illustrates the postulate that meaning will be assigned to, rather than received from, the objects admitted to perception.

There are at least three sets of signs—or cues—to which Mr. A may attribute meaning in this setting.[26] Any of them may trigger interpretations or reactions of one kind or another. One set of cues derives from the environment itself. These cues are identified in Figure 1 as public cues (C_{PU}). To qualify as a public cue any object or sound or circumstance must fulfill two criteria. First, it must be a part of, or available to, the perceptual field of all potential communicants. Second, it must have been created prior to the event under analysis and must remain outside the control of the persons under observation. Two types of public cues can be distinguished. Natural cues, those supplied by the physical world without the intervention of man, include atmospheric conditions of temperature and humidity, the visual and tactual properties of minerals, the color and

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[26] The more generic term of cues has been adopted to avoid some of the difficulties that attend the sign-symbol distinction.

forms of vegetable life and climatic crises such as hurricanes and rainstorms. Artificial cues, those resulting from man's modification and manipulation of his environment, include the effects created by the processing and arranging of wood, steel and glass, the weaving and patterning of clothing, the control of climate through air or sound conditioning.

As Mr. A glances about the office he may be aware of the arrangement of furniture, a worn carpet, a framed reproduction of a Miro painting, a slightly antiseptic odor, an end table covered with magazines. To any of them he may attach significance, altering his attitude toward his doctor or himself. In some instances the cues may be authored and edited by a number of persons. The painting, for example, is a message from Joan Miro, its framing a message from the decorator, its choice and location a message from the doctor. All these cues are available potentially to anyone who enters the reception room. The perception of any specific cue, or the meaning assigned to it, however, will be similar for various people only to the extent that they possess the same sensory acuity, overlapping fields of perception, parallel background experiences, and similar needs or purposes.

A second set of cues consists of those elements or events that are essentially private in nature, that come from sources not automatically available to any other person who enters a communicative field. Private cues might include the sounds heard through a pair of earphones, the sights visible through opera glasses, or the vast array of cues that have their origin in the taste buds or viscera of the interpreter. In the case of Mr. A, the private cues (C_{PR}) might include the words and pictures he finds as he riffles through a magazine, the potpourri of objects he finds in his pocket, or a sudden twitch of pain he notices in his chest. Public and private cues may be verbal or nonverbal in form, but the critical quality they share is that they were brought into existence and remain beyond the control of the communicants.

Although no one else has yet entered the communicative field, Mr. A has to contend with one additional set of cues. These, however, are generated by, and are substantially under the control of, Mr. A himself. They consist of the observations he makes of himself as he turns the pages of his magazine, sees himself reflected in the mirror, or changes position in his chair. The articulation and movement of his body are as much a part of his phenomenological field as any other cue provided by the environment.[27] Indeed if this were not true he would be incapable of coordinated acts. To turn a page requires the assessment of doz-

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[27] While this sort of intra-personal communication is usually identified as feedback, the connotation of this term may be unfortunate when applied loosely to human communication for it suggests a sender-receiver dualism where there may be none, and implies that a person receives information about his performance from his environment. Actions, however, are incapable of sending meanings back to the source. The individual acts and as he acts observes *and* interprets his own behavior. As long as this is understood the term need not cause difficulty but this does not always seem to be the case in the literature on communication.

ens of subtle muscular changes. These cues are identified in Figure 1 as behavioral, nonverbal cues ($C_{BEH_{NV}}$). They comprise the deliberate acts of Mr. A in straightening his tie or picking up a magazine as well as his unconscious mannerisms in holding a cigarette or slouching in his chair. They differ from public cues in that they are initiated or controlled by the communicant himself. When public or private cues are assigned meaning, Mr. A is free to interpret as he will, but his meanings are circumscribed to some extent by the environment around him. Where his own behavior is involved, he controls (consciously or unconsciously) *both* the cues that are supplied and their interpretations as well. Two sets of lines are required in Figure 1 to reflect the circularity of this communication process, one to indicate the encoding of meaning in the nonverbal behavior of Mr. A, the other to show interpretation of these acts by Mr. A.

The jagged lines (⌇⌇⌇⌇) at either end of the series of public, private and behavioral cues in Figure 1 simply illustrate that the number of cues to which meaning may be assigned is probably without limit. But, although unlimited in number, they can be ordered in terms of their attractiveness, or potency, for any viewer. Men do not occupy a neutral environment. The assumptive world of Mr. A, a product of his sensory-motor successes and failures in the past, combined with his current appetites and needs, will establish his set toward the environment so that all available cues do not have equal valence for him. Each will carry a value that depends upon its power to assist or defeat him in pursuit of adequate meanings. Tentative valences have been assigned to the public, private, and behavioral cues in Figure 1 through the addition of a plus, zero or minus sign $(+, 0, -)$ following each of them.

The complexity of the process of abstracting can readily be illustrated through the diagram simply by specifying the precise objects which Mr. A includes or excludes from his perception. Research on dissonance and balance theory suggests the direction followed in the discrimination, organizing and interpreting of available cues.[28] Unless other factors intervene, individuals tend to draw toward the cues to which positive valences can be assigned, that is toward cues capable of reinforcing past or emerging interpretations, and away from cues to which negative valences are attached or those that contradict established opinions and behavior patterns.

By a balanced state is meant a situation in which the relations among the entities fit together harmoniously; there is no stress towards change. A basic assumption is that sentiment relations and unit relations tend toward a balanced state. This means that sentiments are not entirely independent of the perceptions of unit connections between entities and that the latter, in turn, are not entirely independent of sentiments. Sentiments and unit relations are mutually interdependent. It also means that if a balanced state does not exist, then forces toward this state will arise. If a change is not possible, the state of imbalance will produce tension.[29]

[28] See Leon Festinger, *A Theory of Cognitive Dissonance* (Row Peterson, 1957) and Fritz Heider, *The Psychology of Interpersonal Relations* (Wiley, 1958).

[29] Heider, Ibid., p. 201.

Successive diagrams of a particular communicative event could be made to demonstrate in a cognitively dissonant setting how a person avoids negatively-loaded cues, maximizes or minimizes competing cues, or reassigns valences in order to produce consonance.

An illustration, even though oversimplified, will suggest the course of Mr. A's communication with himself. At the moment he is faintly aware of an antiseptic odor in the room, which reinforces his confidence in the doctor's ability to diagnose his illness $(C_{PU}+)$. As he glances through a magazine $(C_{PR}0)$ he is conscious of how comfortable his chair feels after a long day on his feet $C_{PR}+)$. Looking up, he glances at the Miro reproduction on the wall, but is unable to decipher it $(C_{PU}0)$. He decides to call the nurse. As he rises he clumsily drops his magazine $(C_{BEH_{NV}}-)$ and stoops to pick it up, crosses the room $(C_{BEH_{NV}}0)$, and rings the call bell firmly and with dignity $(C_{BEH_{NV}}+)$.

INTERPERSONAL COMMUNICATION

The communication process is complicated still further in Figure 2 by the appearance of a second person (P_2), let us say Dr. B, who enters the reception room to look for his next patient. The perceptual field of Dr. B, as that of Mr. A, will include the public cues supplied by the environment (C_{PU}). These cues, however, will not be identical for both persons, nor will they carry the same valences, because of differences in their backgrounds and immediate purposes. Dr. B may notice the time on the wall clock or the absence of other patients, and he may assign different valences to the disarray of magazines on the table or to the Miro print. In addition, Dr. B will be interpreting private cues (C_{PR}) that belong exclusively to his own phenomenological field, such as his own fatigue at the moment, and these may alter the interpretations he attaches to Mr. A's conduct. Finally, there are the behavioral cues $(C_{BEH_{NV}})$ that accompany his own movements to which he must be tuned in order to act with reasonable efficiency.

Even before any verbal exchange takes place, however, there will be a shift in communicative orientation of both individuals. As Mr. A and Dr. B become aware of the presence of the other (sometimes before), each will become more self-conscious, more acutely aware of his own acts, and more alert to the nonverbal cues of the other as an aid to defining their relationship. Each will bring his own actions under closer surveillance and greater control. The doctor, as he enters, may assume a professional air as a means of keeping the patient at the proper psychological distance; the patient, upon hearing the door open, may hastily straighten his tie to make a good impression. A heightened sensitivity and a shift from environmental to behavioral cues identifies the process of social facilitation. Men do not act—or communicate—in private as they do in the presence of others. While audiences represent a special case of social facilitation, and
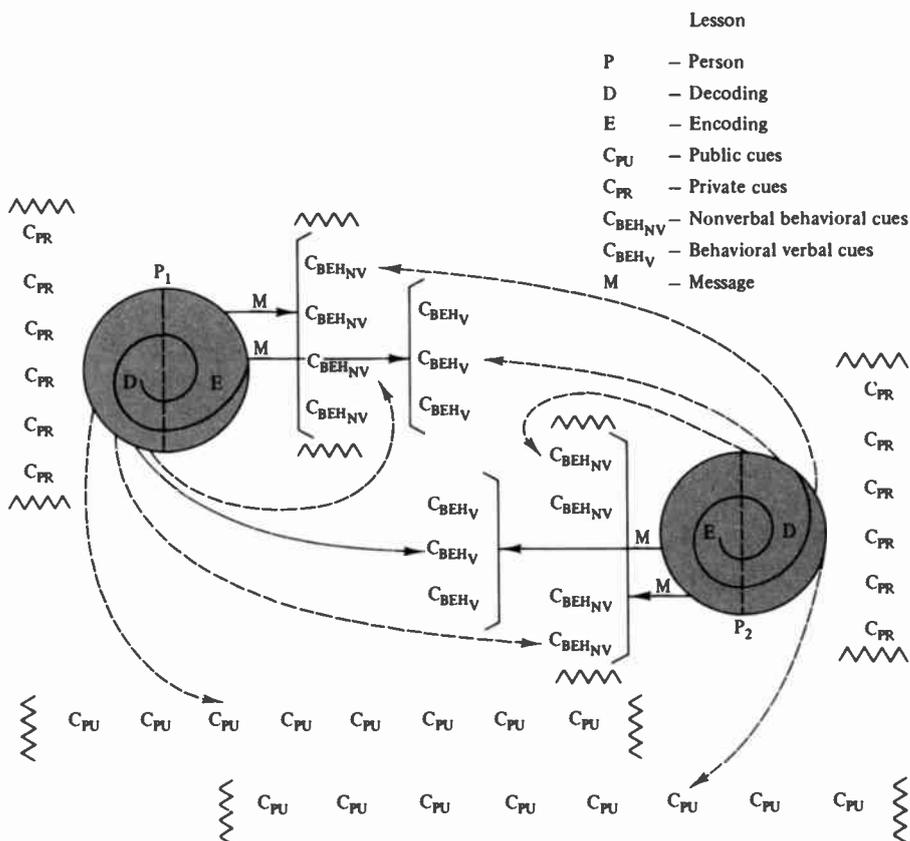
FIGURE 2.

mobs an unusually powerful and dramatic one, the mere appearance of a second person in an elevator or office will change the character and content of self-to-self communication in both parties.[30]

At some point in their contact, and well before they have spoken, Mr. A and Dr. B will have become sufficiently aware of each other that it is possible to speak of behavioral cues as comprising a message (M). That is, each person will begin to regulate the cues he provides the other, each will recognize the possible meanings the other may attach to his actions, and each will begin to interpret his own acts as if he were the other. These two features, the deliberate choice and control of cues and the projection of interpretation, constitute what is criterial for identifying interpersonal messages.

[30] See Erving Goffman, *The Presentation of Self in Everyday Life* (Doubleday Anchor Books, 1959).

Dr. B, crossing the room, may initiate the conversation. Extending his hand, he says, "Mr. A! So glad to see you. How are you?" [31] At this point, despite the seeming simplicity of the setting and prosaic content of the message, Mr. A must solve a riddle in meaning of considerable complexity. In a nonclinical environment where the public cues would be different, perhaps on a street corner (C_{PU}), Mr. A would regard this message (C_{BEH_V}) as no more than a social gesture, and he would respond in kind. This on the other hand, is a clinic (C_{PU}). Is this remark, therefore, to be given the usual interpretation? Even here, the nonverbal cues ($C_{BEH_{NV}}$) of Dr. B, the friendly facial expression and extended hand, may reinforce its usual meaning in spite of the special setting. On the other hand, these words (C_{BEH_V}) may be interpreted only as showing the sympathetic interest of Dr. B in Mr. A. In this case, the message requires no answer at all but is a signal for Mr. A to come into the office. In spite of the clinical setting (C_{PU}) and the gracious gesture ($C_{BEH_{NV}}$), however, the last phrase (C_{BEH_V}), because of a momentary hesitation just before it ($C_{BEH_{NV}}$), might be an invitation for Mr. A to begin giving an account of his symptoms. In deciphering the meaning, Mr. A will have to assign and reassign valences so that a coherent interpretation emerges. (No valences are assigned in Figure 2 because their positive, negative or neutral value would depend upon the interpretive decisions of Mr. A and Dr. B.) All three contexts, the environmental, behavioral and verbal will have to be scanned, assigned meanings, and compared in order for Mr. A to determine a suitable response.

Meanwhile, Dr. B is involved in weaving some interpretations of his own out of the cues he detects and the valences he assigns to them. Mr. A smiles back and says, "Nice to see you again, too. I wish the circumstances were different." At this moment Dr. B turns his attention from the carpet which needs repairing (C_{PU}) to Mr. A. How should he interpret this message? Since they are in a clinic (C_{PU}) it is not surprising that Mr. A should speak of the "circumstances" of his visit. Yet, could this be a warning that the visit concerns a serious medical problem rather than a trivial one? Mr. A's relaxed posture ($C_{BEH_{NV}}$) does not reinforce the former meaning, but his flushed face does ($C_{BEH_{NV}}$). Or could this remark be no more than a semi-humorous reference to a past episode on the golf links (C_{PR})? In any case, Dr. B, like Mr. A, must reduce the ambiguity in the situation by experimentally assigning meanings to public, private, nonverbal and verbal cues, relating them to the surrounding conditions of time and place, and determining the extent of congruence or incongruence in the meanings given

[31] We do not have, as yet, in spite of the efforts of linguists and students of nonverbal behavior, an adequate typology for identifying message cues. In the case of this simple remark, is the unit of meaning the phoneme, morpheme, word, or phrase? And, in the case of nonverbal cues, is it to be bodily position, gesture, or some smaller unit? Until we have better descriptive categories the careful analysis of communicative acts cannot proceed very far.

them. Not until further verbal and nonverbal cues are supplied will Dr. B be confident that he has sized up the message properly.

This analysis suggests that meanings are assigned to verbal cues according to the same principles that govern the interpretations of all other cues. Indeed, this seems to be the case.[32] Meaning is cumulative (or ambiguity reductive) and grows as each new cue, of whatever type, is detected and assigned some sort of valence. Verbal cues are distinctive only in the sense that they constitute a special form of behavior, are finite in number, and are presented in a linear sequence.

One further clarification must be added concerning the transferability of cues. A public cue can be transformed into a private cue by manipulating it so that it is no longer available to all communicants. Mr. A may refold his coat so that a worn cuff cannot be seen by Dr. B, or the doctor may turn over his medical chart so that Mr. A cannot read his entry. Private cues may be converted into public ones. Mr. A may want Dr. B to see a cartoon in the *New Yorker* he has been reading or Dr. B may choose to show Mr. A the latest photograph of his daughter. Sometimes an action on the part of a communicant involves manipulating or altering an environmental cue. Dr. B may unconsciously rearrange the magazines on the table while speaking to Mr. A and, in this case, environmental and behavioral cues merge.

The aim of communication is to reduce uncertainty. Each cue has potential value in carrying out this purpose. But it requires that the organism be open to all available cues and that it be willing to alter meanings until a coherent and adequate picture emerges. Conditionality becomes the criterion of functional communication which, according to Llewellyn Gross, "involves the attitude of thinking in terms of varying degrees and changing proportions; the habit of acting provisionally and instrumentally with a keen awareness of the qualifying influence of time, place, people, and circumstances upon aspirations and expectations; the emotional appreciation for varieties and nuances of feeling." [33]

What is regarded in various academic fields as an "error of judgment," or "a communication breakdown," or a "personality disturbance," appears to be a consequence of a sort of communicative negligence. The nature of this negligence is intimated in what a British psychiatrist has called "The Law of the Total Situation." [34] To the extent that a person is unable to respond to the total situation—because he denies critical cues from the environment, distorts verbal or nonverbal cues from the opposite person, fails to revise inappropriate assump-

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[32] James M. Richards, "The Cue Additivity Principle in a Restricted Social Interaction Situation," *Journal of Experimental Psychology* (1952), p. 452.

[33] Llewellyn Gross, "The Construction and Partial Standardization of a Scale for Measuring Self-Insight," *Journal of Social Psychology* (November, 1948), p. 222.

[34] Henry Harris, *The Group Approach to Leadership Testing* (Routledge and Kegan Paul, 1949), p. 258.

tions regarding time and place—to that extent will it be difficult, or impossible, for him to construct meanings that will allow him to function in productive and satisfying ways.

The observance and disregard of the Law of the Total Situation can be documented again and again in human affairs, at the most intimate interpersonal levels, and at the most serious public levels. Since communicative negligence is so omnipresent, it might be refreshing to consider an instance that illustrates a sensitive observance of the Law of the Total Situation.

Betty Smith, writing in *A Tree Grows in Brooklyn*, tells of a neighborhood custom. On the night before Christmas a child could win a tree if he stood without falling while it was thrown at him. When Francie was ten and Neeley nine, they went to the lot and asked the owner to throw his biggest tree at the two of them. The small children clasped each other to meet the force of the great tree. For just a moment the man agonized, wanting simply to give it to them, but knowing that if he did he would have to give away all his trees, and the next year no one would pay for a tree. Realizing he must do it, he threw the tree as hard as he could. Though the children almost fell, they were able to withstand the impact and claimed the tree. As they started to pick it up Francie heard the man shout after them, "And now get the hell out of here, you lousy bastards." There was no doubt about what he said. But Francie was able to hear beyond the rough words. She knew that this tone of voice, on Christmas Eve, from one who had no other language really meant, "Merry Christmas, God bless you." The man could not have said that, and Francie recognized it. He used the only words he had and she was able to understand him, not from his words alone, but from the totality of time, place, personality, and circumstance.

The complexities of human communication present an unbelievably difficult challenge to the student of human affairs. To build a satisfactory theory about so complex an event through sole reliance upon the resources of ordinary language seems less and less promising. Any conceptual device which might give order to the many and volatile forces at work when people communicate deserves attention. The value of any theoretical innovation, such as a symbolic model, may be measured by its capacity to withstand critical attack, its value in prompting new hypotheses and data, or finally, by its contribution to the improvement of human communication. The pilot models described here may not fulfill any of these criteria completely, but they will have served a useful purpose if they prompt the search for better ways of representing the inner dynamics of the communication process.[35]

[35] Only slight modifications are needed to adapt these models for use in representing the dynamics of mass communication.

A HELICAL MODEL
OF COMMUNICATION

Frank E. X. Dance

Nineteen hundred forty-eight, the year in which Shannon's first papers were published in the *Bell System Technical Journal* [1] was also the year of first publication of Norbert Wiener's classic, *Cybernetics: or Control and Communication in the Animal and the Machine.*[2] The dual thrust of these seminal works spawned the rapid popularization and dissemination of an almost entirely new vocabulary in the communication field. "Bit," "entropy," "ergodic theory," "feedback," "information" (in the mathematical or statistical sense), "noise," "probability," "redundancy" and many other terms were quickly integrated into communication terminology and were extended by analogy from their original fields to almost any discipline that had an interest in self-examination from the viewpoint of communication.

"Feedback" became especially popular and justly so. The feedback concept

[1] Shannon, C. E., "The Mathematical Theory of Communication," *Bell System Technical Journal.* (July and October, 1948).

[2] Wiener, N., *Cybernetics: Or Control and Communication in the Animal and the Machine.* New York: John Wiley & Sons, 1948.

has proved to be invaluable in clarifying many areas of human interaction that until its availability had been shadowily felt but inaccurately understood. In the area of human communication, the impact of the concept of feedback was most notable in the early fifties, when there was great propagation and support for the notion of the circularity of the communication process. Today, it seems probable that most people, if given a choice between describing the communication process as linear or as circular, would opt in favor of circularity. One plausible inference is that at some time people generally felt that communication was probably linear. Now, both linearity and circularity suggest process, and either is in keeping with the general conviction that communication is a process. However, the geometrical analogy of the two choices is quite different. The feedback principle allowing for analysis of present behavior so as to alter future behavior on the basis of the success or failure of current behavior is the seeming basis for the popularity of the circular model. But which of the two figures is most accurate and appropriate for those seeking a geometrical-spatial visualization of the communication process?

The circular-communication image does an excellent job of making the point that what and how one communicates has an effect that may alter future communication. The main shortcoming of this circular model is that if accurately understood, it also suggests that communication comes back, full-circle, to exactly the same point from which it started. This part of the circular analogy is manifestly erroneous and could be damaging in increasing an understanding of the communication process and in predicting any constraints for a communicative event.

The linear model does well in directing our attention to the forward direction of communication and to the fact that a word once uttered cannot be recalled. The changing aspect of communication is also implied in a linear model. However, the linear image betrays reality in not providing for a modification of communicative behavior in the future based upon communicative success or shortcomings in the past.

Neither model is flawless, nor is there much hope for a completely isomorphic geometric model of something as complex as human communication. However, is there any other geometric figure that, although not perfect, has somewhat more success in helping us visualize the reality of human communication? Perhaps so.

In the past decade and a half, one specific geometrical figure has cropped up as a descriptive device in a number of disciplines. In the beautiful work on deoxyribonucleic acid and its role in the genetic determination of man, we are often reminded of the DNA molecule's helical shape. "The DNA molecule is a helix, a spiral that looks like a coiled ladder." [3] In another area, philosophy, we find Teilhard de Chardin saying:

[3] "DNA's Code: Key to All Life." Special Reprint from *Life*, 1963.

Like the geologist occupied in recording the movements of the earth, the faultings and foldings, the palaeontologist who fixes the position of the animal forms in time is apt to see in the past nothing but a monotonous series of homogeneous pulsations. In their records, the mammals succeeded the reptiles which succeeded the amphibians, just as the Alps replaced the Cimmerian Mountains which had in their turn replaced the Hercynian range. Henceforward we can and must break away from this view which lacks depth. We have no longer the crawling "sine" curve, but the spiral which springs upward as it turns. From one zoological layer to another, *something is carried over: it grows jerkily, but ceaselessly, and in a constant direction.*[4]

Although there are some who distinguish between a spiral and a helix on the basis that a spiral is two-dimensional and a helix three-dimensional, common usage, even in the scientific community, treats the two words as synonyms. The helix combines the desirable features of the straight line and of the circle while avoiding the weaknesses of either. In addition, the helix presents a rather fascinating variety of possibilities for representing pathologies of communication. If you take a helically-coiled spring. such as the child's toy that tumbles down staircases by coiling in upon itself, and pull it full out in the vertical position, you can call to your imagination an entirely different kind of communication than that represented by compressing the spring as close as possible upon itself. If you extend the spring halfway and then compress just one side of the helix, you can envision a communicative process open in one dimension but closed in another. At any and all times, the helix gives geometrical testimony to the concept that communication while moving forward is at the same moment coming back upon itself and being affected by its past behavior, for the coming curve of the helix is fundamentally affected by the curve from which it emerges. Yet, even though slowly, the helix can gradually free itself from its lower-level distortions. The communication process, like the helix, is constantly moving forward and yet is always to some degree dependent upon the past, which informs the present and the future. The helical communication model offers a flexible and useful geometrical image for considering the communication process.

A helix can also be used to represent learning. Bruner hypothesizes that "any subject can be taught effectively in some intellectually honest form to any child at any stage of development."[5] Thus, if one were to consider the construction of a helical communication curriculum, he would first try and set his normative objectives for the minimal communicative behaviors and knowledge needed for successful participation in any particular culture in any particular era, and then working from the top, or optimal, behaviors and knowledge down, he would try to penetrate slowly to the beginning point of the helix, watching closely at each turn of the helix for those behaviors that are new and those based upon be-

[4] Teilhard de Chardin, P., *The Phenomenon of Man*. New York: Harper & Row, Publishers, 1959, pp. 147–148.

[5] Bruner, J. S., *The Process of Education*. Cambridge, Mass.: Harvard University Press, 1965, p. 33.
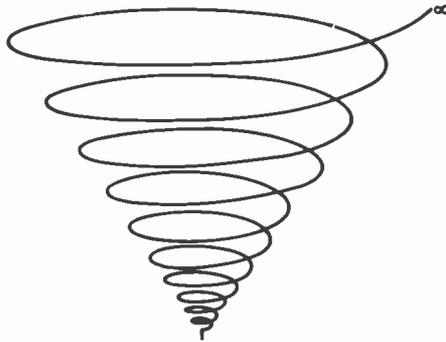
FIGURE 1. A Helical Spiral as a Representation of Human Communication

haviors already present in the developing cycle. Thus, we might eventually build a repertoire of skills and information that indicate the basic communicative elements needed at each stage in the progressive acquisition of the minimal communication behaviors and knowledge needed for successful human functioning. It would seem that such a study, when matched against already available knowledge concerning the developmental psychology and physiology of the child and adult, might result in a truly valuable and viable body of knowledge for those interested in speech communication education. Of course, there is no magic final curve of our personal communication helix, nor of the helical communication curriculum, for the helix by its very nature is always progressing upward even as it turns back upon itself and is affected by its own past conformations.

If, then, we view an individual's communicative development in a helical fashion, we can suggest that from the moment of conception, the individual's communication helix begins to develop and move forward and in upon itself simultaneously. Freud stated, ". . . the original helplessness of human beings is thus the primal source of all moral motives." Rene Spitz extends this observation to suggest that the original helplessness of human beings is the ontogenetic base for all communicative behavior that progresses along with the development of the human being, from communicative behavior shared with infrahuman forms of being to that communicative behavior peculiar to human beings. Certainly the human being is never more helpless in terms of self-control and self-sufficiency than when he is in the womb. In essence, during his foetal state, the individual's action is his communication; what Spitz calls "discharge of drive" is the action. At the same time this prenatal and neonatal discharge-activity can be viewed by an observer as communication. ". . . it has become clear, that at birth, and for a long time afterwards, action and communication are one. Action performed by the neonate, is only discharge of drive. But the same action, when viewed by the

observer, contains a message from the neonate." [6] Meerloo, in his essay, speaks to this point when he observes that, "Basically, separation is felt as a danger threatening the very survival of the individual entity. Communication, therefore, has an essentially anti-catastrophic part to play." [7] To compound our helical model we must remember that in the process of communicative self-emergence and self-identification the interaction with perceived others is essential. As a result, we have two or more helixes interacting and intertwined. It is in this interaction that the neonate develops his self-identity, his mind, his humanness. The process of this development is the focus of much interesting research that still awaits careful cross-indexing and systematizing and that is most meaningful to the field of human communication theory.[8] In carefully observing the development of the child's communicative capacities and abilities, we may well continue to find valuable clues to the development of communicative capacities and abilities in the race. Haeckel's theorem, "Ontogeny is a brief and rapid recapitulation of phylogeny caused by the physiological functions of heredity and adaptation," [9] although seriously challenged, can still provide some provocative and thoughtful moments for those interested in the phylogenesis of human communication.

[6] Spitz, R. A., *No and Yes*. New York: International Universities Press, Inc., 1957, pp. 145–146.

[7] Meerloo, J. A. M., "Contributions of Psychiatry to the Study of Human Communication," *Human Communication Theory*, ed. Frank E. X. Dance. New York: Holt, Rinehart and Winston, 1967, p. 133.

[8] Vygotsky, L. S., *Thought and Language*. New York: John Wiley & Sons, 1962. Piaget, J., *The Language and Thought of the Child*. Cleveland, Ohio: The World Publishing Co., 1962.

[9] Haeckel, E., *Generelle Morphologie der Organismen*, II Band. S. 300 (Berlin, 1866) ; as quoted in *The Origin of Man* by Mikhail Nesturkh. Moscow: Foreign Languages Publishing House, 1959, p. 20.

SPEECH SYSTEM

Edward Mysak

SPEAKING AS A
MULTIPLE-LOOP PHENOMENON

The speech system may be viewed as a closed multiple-loop system containing feedforward and feedback internal and external loops. Following are details concerning the internal and external loop aspects.

INTERNAL LOOP

This aspect is concerned with all those processes which may take place within the individual and which are responsible for speech formation and monitoring and speech production and monitoring. Seven processes may be recognized in the operation of this internal system. It should be stressed, however, that not all seven processes are necessarily engaged during any particular speech act.

1. THOUGHT PROPAGATION. Thought patterns are evoked by either external

stimulation or evoked from within, and may take the form of various types of images (although more often than not they take the form of inner speech).

2. WORD FORMATION.   The feeding forward of developed thought patterns to areas in the brain responsible for creating corresponding word patterns constitutes the word formation process.

3. THOUGHT PATTERN—WORD PATTERN COMPARISON.   The thought pattern—word pattern comparison process describes so-called inner speech where one checks on what one is about to utter. Not all speaking situations require such processing. However, when a speaker desires to utter something in just a certain way, or if one needs to be cautious in his choice of words, this operation may be engaged. Such inner speech monitoring represents one of the feedback loops which make up the internal aspect of the multiple-loop speech system.

4. WORD PRODUCTION.   Actual word production occurs when impulses from the word formation area are fed forward, activating the primary motor speech areas which, in turn, innervate the appropriate respiratory, phonatory, and articulatory musculature.

5. ACTUAL WORD PRODUCT—DESIRED WORD PRODUCT COMPARISON.   The operation of actual word product—desired word product comparison involves error scanning and measuring of the speech product; this activity ensures the articulatory accuracy of the speech output. Internal loops in this circuit may carry auditory, tactile, and proprioceptive signals back to the brain for processing. Speech product feedback monitoring describes the function of this operation.

6. WORD PRODUCT—THOUGHT PATTERN COMPARISON.   Concomitant with speech product feedback monitoring is speech content feedback monitoring. This feedback process ensures as high a degree of correspondence between thoughts and words as may be possible. Toward this end, the individual continually scrutinizes speech content output, compares it with his thoughts, and makes appropriate adjustments when necessary. The operation represents still another aspect of the internal, multiple-loop system.

7. SPEECH RECYCLING.   If internal, multiple-loop activity is error-free, there is a continuing reduction of thoughts into words, or speech recycling.

Inspection of this internal, multiple-loop complex reveals at least two levels of activity: A higher "thinking level" devoted to thought and speech content monitoring, and a lower more automatic "doing level" devoted to articulatory (also rate, loudness, and voice factors) or speech product monitoring. It is because of these two levels of operation that an individual who misarticulates may not be auditorially aware of his error sound; that is, such an individual may be consciously engaged in speech content monitoring with his ears, but because speech product monitoring is usually left to tactile and proprioceptive channels, and is therefore on a less conscious level, he is not aware of his error sound.

EXTERNAL LOOP

The feedforward aspect of the external loop of the multiple-loop speech system involves the directing of the spoken message at a listener; the feedback aspect consists of the evaluation of listener reactions by the speaker and the making of appropriate output corrections depending on the nature of these reactions. In order to complete the series of operations performed by the internal and external multiple-loop speech system, three more processes must be added to those already discussed. These are: word product—listener reaction comparison; actual listener reaction—desired listener reaction comparison, and, finally, if all is error-free, speech recycling. Further information pertaining to these latter processes will be presented in the next section.

In summary, then, considering both the internal and external loop aspects of the total speech system, the following ten operations may be recognized during a full cycle of speech behavior: (1) thought propagation; (2) word formation (feedforward); (3) thought pattern—word pattern comparison (feedback); (4) word production (feedforward); (5) actual word product—desired word product comparison (feedback); (6) word product—thought pattern comparison (feedback); (7) internal, multiple-loop speech recycling; (8) word product—listener reaction comparison (feedback); (9) actual listener reaction—desired listener reaction comparison (feedback); and (10) internal and external, multiple-loop speech recycling.

INTERNAL, AND EXTERNAL,
MULTIPLE-LOOP SPEECH BEHAVIOR

Next, an example of the operation of a multiple-loop speech cycle will be presented. Let us imagine speaking to an individual and attempting to recall a mutual friend's name:

First, an idea is generated which stands for the friend, for example, you may visualize the friend's face or some other characteristic (thought propagation).   ·

Second, the idea of the friend automatically (and reciprocally) excites the appropriate word association which, let us say, is "Joan" (word formation).

Third, there may be feedback and comparison of the word with the idea or "inner speech" checking (thought pattern—word pattern comparison).

Fourth, once it is willed, the release of the word pattern automatically results in the excitation of the appropriate neuromuscular configuration, and the word "Joan" is uttered (word production).

Fifth, there is automatic speech product feedback (auditory, tactile, and proprioceptive signals) monitoring or inspection for the articulatory accuracy of

the spoken word "Joan" (actual word product—desired word product comparison).

Sixth, a concomitant speech content feedback monitoring occurs on an auditory basis, whereby the accomplished spoken word is checked with the idea that it is supposed to represent (word product—thought pattern comparison).

Seventh, if the system is free of speech product and speech content errors, it proceeds to process additional speech cycles (internal loop speech recycling).

In order to illustrate the error-measuring, self-adjusting nature of the internal loop mechanism, or corrective internal loop recycling, let us suppose that the spoken word "Joan," during the sixth operation, feeds back error signals into the speech system to the effect that the word "Joan" is not the correct name after all. This causes the system to automatically scan for a new word association for the thought pattern, and let us imagine that these recycling procedures result in the development of the new word product, "Jane." This new word product may now be observed to create speech system stability.

Eighth, the external loop becomes active as this new word product is directed at the listener for his consideration. Suppose the corrected word product "Jane" causes the listener to shake his head in a negative fashion, and that these negative signals are fed back to the speaker. The listener reaction may be due to the fact that the word "Jane" elicits a thought pattern of a person other than the mutual friend in question and this situation causes the automatic generation of negative signals from the listener (word product—listener reaction comparison).

Ninth, because the speaker seeks agreement from his listener, he carefully scans the reaction of his listener. And, as an example of external loop error measuring and self-adjusting, the error signals emanating from the listener are received and acted upon causing corrective recycling, and the system may be noted to return to the original word product "Joan." This word product may now produce positive feedback signals from the listener (actual listener reaction—desired listener reaction comparison).

Tenth, when there are positive feedbacks from both speaker and listener, the speaker proceeds to reduce new thoughts into words and the conversation continues (multiple-loop speech recycling).

The foregoing example reveals that dynamic oral communication depends on the interaction of a series of automatic and reciprocal relationships within the many internal and external loops which comprise the multiple-loop speech system. It also brings to mind the principle of the unity of the multiple-loop oral linguistic circuitry; a principle analogous to that described by Meader and Muyskens (1959) in their discussion of the unity of the organism. Four aspects of the principle may be recognized.

1. RELATIVITY. All parts of the internal and external loop oral linguistic circuitry are interrelated.

2. SELF-REFLEXIVENESS.   Every part of the circuitry tends to influence every other part.

3. NONELEMENTALISM.   No part of the total circuitry can be fully understood in isolation.

4. UNITARY STRUCTURE.   Understanding of each part of the total circuitry in its relation to the other is essential to the understanding of the total circuitry.

The principle has important theoretical and practical significance to the speech scientist and clinician. So often research or remedial procedures are conducted without consideration of one or another of its aspects.

Finally, returning to the speaking example, malfunctioning in any one of the ten operations described may reflect itself in some type of oral communicative disorder. Problems may develop from speech generation or feed forward sources, or from speech monitoring or feedback sources. Certain disorders, therefore, are suggested by speech system cybernation which are not now covered by our present systems of classification.

FUNCTIONAL COMPONENTS
OF THE INTERNAL SPEECH LOOP

Detailed descriptions of the various functional components included in the internal loop of the speech system as well as the anatomical and physiological representations of these components will now be presented. A model of the internal loop has already been presented by the author in a journal article (Mysak, 1959) ; the model was an extension of one designed by Fairbanks (1954). Comparison of that model and its accompanying discussion with the present Figure 1 would reveal numerous changes. These changes have come about due to the availability of new data and also in the interest of simplifying and clarifying the expressed concepts.

RECEPTOR

The receptor unit represents the first section of the internal loop. It is made up of three basic components which subserve the estimating function of the sensorium. This section processes sensations such as: radiant energy via the eye (receptor 1), sound pressure energy via the ear (receptor 2), and mechanical energy via the end organs of touch (receptor 3). Proprioceptive end organs (receptor 4) are not included; however, it is possible that proprioceptive sensations may also be utilized in speech reception in special cases. The eye and ear are commonly recognized as speech receivers, but it should be recognized that touch and secondary movement sensations can be associated with meaning also. For example, individuals without sight or hearing can learn to make meaningful associations by reacting to touch sensations arising from the act of writing in
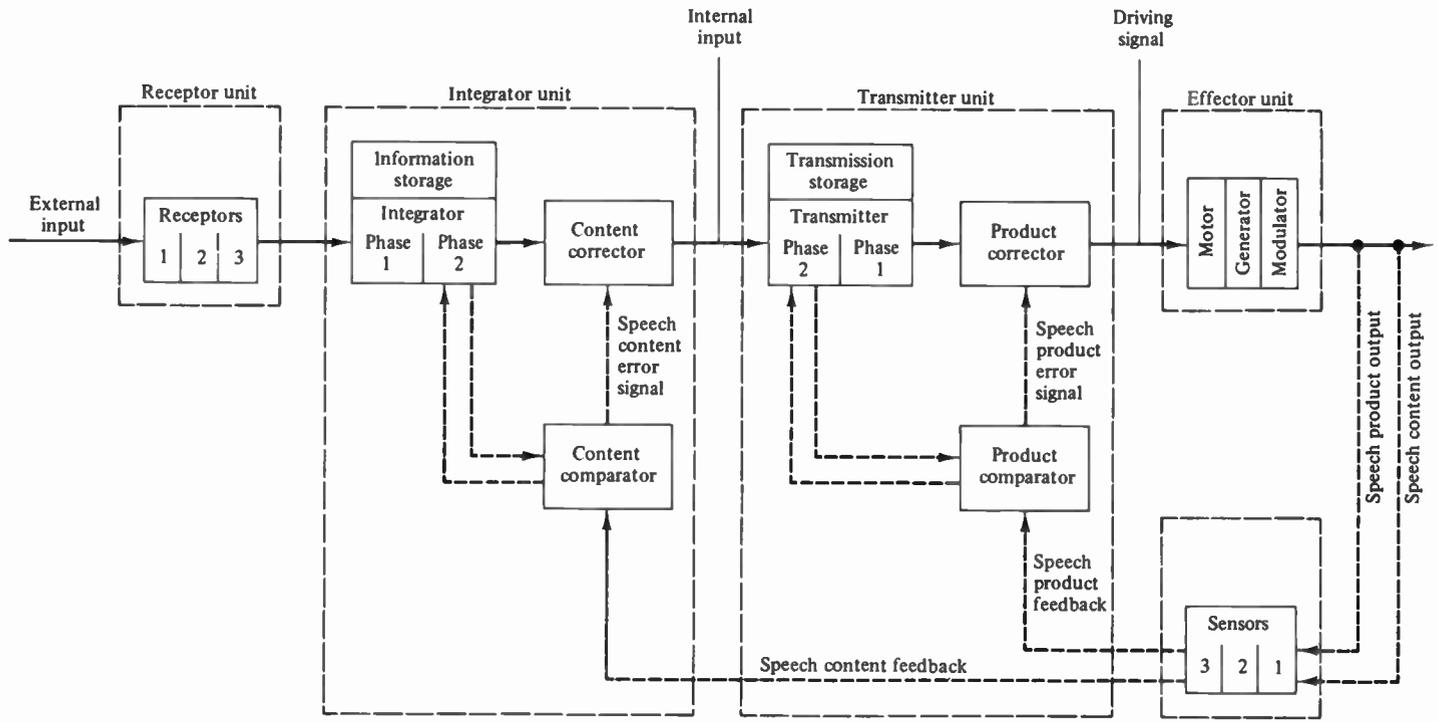
FIGURE 1. Cybernetic analogue of the speech system.

the palms of their hands; or by feeling the movements of the articulators of the speaker as they move and make certain contacts. It has been pointed out that such sensing of articulatory movements, as well as associated intraoral breath pressures, may also have remedial benefits when used with certain types of misarticulators, speech retardates, and aphasics. If the whole receptor unit were utilized in sending a word to a normal individual, he would receive every sensory dimension of which a word is composed. To illustrate: the word might be uttered while the listener listens to and watches the speaker, while he touches and feels the speaker's associated articulatory activity, and while he has his own articulators moved simultaneously through the various articulatory positions by the speaker.

It may be noted that Figure 2 uses a finger, an eye, and an ear to represent tactile, visual, and auditory reception. The cybernetic analogue (Figure 1) places all the components within one unit to indicate the usual concomitant bisensory reception of such external speech stimuli.

INTEGRATOR

The second section of the system is called the integrator unit. Figure 1 shows that it is comprised of three basic components; the phase 1 integrator, the phase 2 integrator and the information storage component. Incoming information, in the form of speech sounds or other percepts, may be registered, retained, recalled, or responded to by this unit. Phase 1 integration involves the recognizing and the attaching of significance to incoming stimuli; phase 2 integration involves the interpreting and the elaborating of incoming stimuli, in addition to the forming of verbal and nonverbal response attitudes. Information retention is subtended by the storage component which retains or releases stored information upon command.

Phase 1 integration represents the perceptualizing process served by the many primary sensory areas in the brain which recognize and pattern incoming auditory, visual, and tactile stimuli. Phase 2 integration represents the conceptualizing process served by the many secondary sensory areas of the brain which further process the various incoming stimuli in the manner already described. Figure 1 also shows an error-measuring device existing within the unit. In the case of a speech response, this device compares the actual speech content with the prescribed speech content and determines the presence or absence of error performance. The concept of storage, or the recording of perceptual information by the brain, has been interestingly discussed by Penfield and Roberts (1959). They found that stimulation of certain portions of the temporal cortex during brain surgery on conscious patients resulted in vivid and complete re-experiencing of various past experiences by the patients. It would appear that something like a permanent registration of focused-upon sights and sounds takes place in certain temporal lobe brain mechanisms.

An example of the operation of the unit should contribute to the understand-

Receptor unit

Integrator unit

Transmitter unit

Internal input

Effector unit

Speech content error signal

Driving signal

Speech product error signal

External input

Speech content feedback

Speech product feedback

Output

Speech product output

Speech content output

Sensor unit
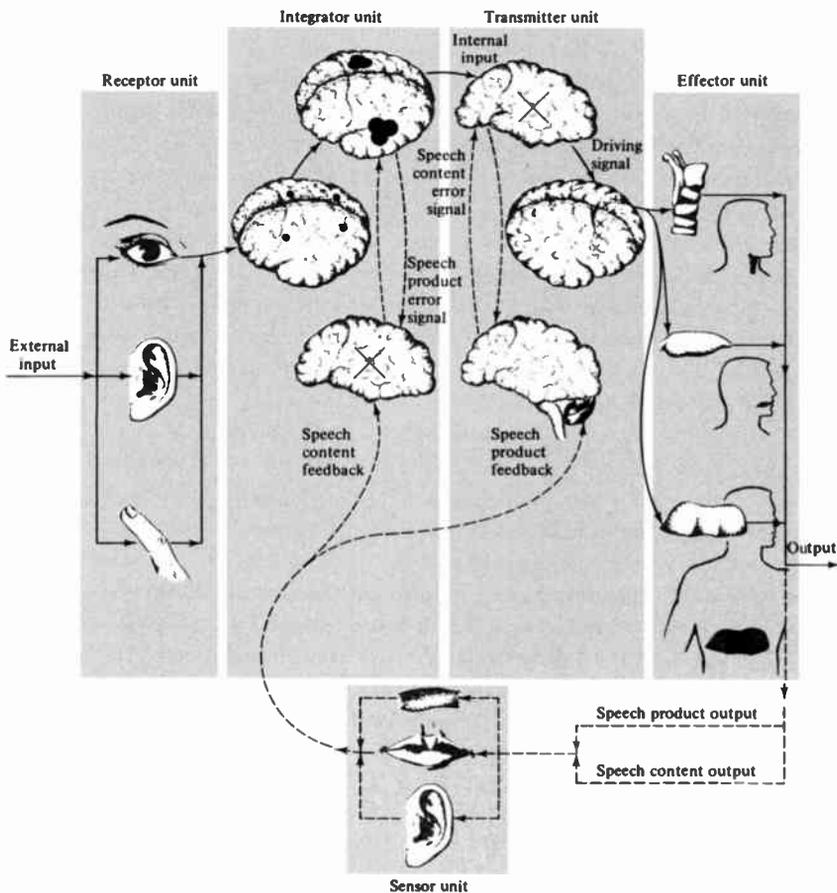
FIGURE 2. Anatomical schema of the speech system.

ing of its function. In normal speech reception, the receptor unit receives acoustical as well as visual events associated with articulatory activity. Phase 1 integration consists of recognition of the acoustical and visual events as significant sound and sight stimuli which should be attended to, further processed, and possibly stored. The latter two steps are functions of phase 2 integration. For example, someone tells you the time is five o'clock. During this utterance, you recognize the spoken words as being pertinent auditory events and you attach meaning to them (phase 1 integration). Further processing of the utterance results in associations such as the utterance means: "It is time to go home"; or, "I cease working at that hour," and so forth (phase 2 integration). Storage of this information for future use may also occur. Additionally, the information represents a

potential oral response, if, for example, someone should specifically ask you, "When do you stop working?"

Figure 2 illustrates that perceptualizing and conceptualizing processes are carried out by both hemispheres. In the cybernetic analogue, all components are placed together within one unit to indicate the interrelatedness of all the processes, thus illustrating the constant interaction among perceptualizing and conceptualizing processes and information storage; such interaction tends to enhance and refine these three functions of the integrator unit. Also present in the analogue's integrator unit is the speech content comparator and speech content corrector, or the integrator unit's corrector device. Figure 2 shows this device in the temporoparietal region of the left hemisphere. The speech content corrector device functions as follows: Once the integrator has selected a certain response, it presents the neuronal pattern or nervous arrangement representing the idea to the cortico-thalamic area, which is the phase 2 transmitter component of the transmitter unit (the next unit to be discussed). This presentation automatically activates a neuronal pattern of corresponding words. In addition, the signal also has the potential for keeping the word neuronal-pattern active even after it discharges its pattern of signals into the phase 1 transmitter component, or the primary motor areas along the Rolandic fissure. Consequently, information in the form of speech is being sent out while at the same time word neuronal-patterns representative of the information being sent persist somewhere in the temporoparietal area in the left hemisphere. Via the auditory mechanism then, the transmitted speech content is fed back to the temporoparietal area where actual speech content patterns are compared with intended speech content patterns. If discrepancies are found, or if changes appear desirable, there is scanning for different neuronal concept-patterns which, consequently, result in different neuronal word-patterns and hence different speech output.

TRANSMITTER

The transmitter section also has three basic parts and hence at least three functions. As already stated, ideas or speech intentions issuing from the integrator unit automatically excite word patterns in the phase 2 transmitter component which, in turn, activate appropriate signals in the phase 1 transmitter component. Phase 1 transmission is responsible for exciting, simultaneously, the motor, generator, and modulator components of the effector unit which are actually responsible for producing the desired spoken words. In addition to these primary parts and functions, the unit also possesses a corrector device which operates as follows: The speech product comparator receives the input signals as well as the output feedback signals and determines the difference between the two; error signals, if present, represent the amount by which the command issued by phase 2 transmission has not been achieved by the effector unit. These error signals are then sent to the speech product corrector which combines error signal and input

signal into a new corrected driving signal. The error signal also returns to the phase 2 transmitter component where it can trigger off the next command when the present output is error-free, or where it can hold the next command when the output contains error factors. This latter function represents a predictor potential existing within the speech product comparator (Fairbanks, 1954) which allows command signals to flow rapidly without feedback monitoring when error-free sound products are anticipated. A similar predictor potential may be considered to exist within the integrator unit. The last component in the unit is called transmission storage and represents the place where functional word patterns are stored. Another function of this component is activated when the individual becomes a listener and is receiving words; that is, words coming from a speaker activate corresponding word patterns in the listener's transmission storage section which, in turn, automatically excite associated ideas.

The phase 2 transmitter component may be considered to be the secondary motor speech area or cortico-thalamic unit whose cortical areas, according to Penfield and Roberts (1959), almost always are located in the left hemisphere. Broca's area, the supplementary motor, and the temporoparietal areas are said to comprise the unit—the latter area is considered the most important. The phase 1 transmitter component represents the primary motor speech areas found along the anterior portion of the central fissure. These areas are responsible for innervating the respiratory-phonatory-articulatory muscle complex which produces the spoken word. As for the error-measuring function during word production, Ruch (1951) has made statements about the activity of the cerebellum which have a bearing on this component. In terms of guidance of movements, he conjectures that the cerebellum could be seen as the comparator component of a servo-mechanism. He indicates that it may receive signals from the cortex which represent the prescribed movement, and proprioceptive feedback signals from the muscles which represent the actual movement. Upon comparison or error measuring, if a discrepancy is found between prescribed and actual movements, appropriate error signals are then sent to the motor cortex which, in turn, alters its signals to the muscles and hence reduces the error.

In terms of function, let us suppose a 21-year-old individual is asked for his age. His speech reception-response mechanism proceeds as follows: (a) Recognition of the auditory events produced by the interrogator by the phase 1 integrator; subsequent interpretation by the phase 2 integrator; and scanning of the integrator's information storage component for the thought pattern corresponding to the idea of personal age. (b) Upon selection of the appropriate thought neuronal-pattern, there is an automatic activation of the appropriate word neuronal-pattern in the phase 2 transmitter component. (c) The release of this word neuronal-pattern by the volitional mechanism excites the phase 1 transmission area along the Rolandic fissure which innervates the respiratory-phonatory-articulatory muscle complex needed to produce the word reponse, "twenty-one."

Figure 2 shows that the transmitter unit is comprised of the cortico-thalamic complex in one hemisphere, the primary motor speech areas represented in both hemispheres, and the comparator device represented, at least in part, by the cerebellum. In Figure 1, the analogue also shows an area for transmission storage which, as previously stated, represents the storage of word neuronal-patterns which the individual has developed and which are available to him.

EFFECTOR UNIT

The effector unit is directly responsible for the production of speech events. It consists of three components: the motor, the generator, and the modulator. [See Figure 1.] The motor is responsible for producing the air column which supports speech, the generator is responsible for vibrating this air column or for voicing, and the modulator is responsible for breaking up the voiced air stream into particular articulatory units. The motor represents the respiratory structures; the generator represents the laryngeal structures; and the modulator the articulatory structures.

Figure 2 displays a larynx, tongue, and diaphragm to represent the effector unit. In Figure 1, the analogue shows all three components within one unit to indicate their interrelatedness.

SENSOR UNIT

The last section of the internal loop is the sensor unit. It has at least three components and is responsible for feeding back speech product and speech content data. Sensor 1 feeds back the auditory dimension of the sounds uttered; sensor 2 the tactile dimension; and sensor 3 the proprioceptive dimension. The unit may also include sensor 4 which represents the visual dimension; visual feedback would occur during mirror-speaking, for instance. Sensor 1 also feeds back the speech content.

To illustrate sensor unit functioning, let us suppose an individual has been asked for the name of his home town, which is Syracuse. However, also suppose that he has just left the dentist's office where he received some novocain which is still in the process of wearing off, and thus he may be experiencing abnormal tactile and proprioceptive feedbacks. Under these circumstances, his response may be uttered as "Thyracuse." The sensor unit feeds back this speech signal to both product and content comparators. The content comparator will find the signal error-free since the name of the city is correct; however, the product comparator will find an error factor since the initial phoneme comprising the word product is incorrect. The product comparator then sends the error signal to the product corrector device for processing and this results in the immediate correction of "Thyracuse" to "Syracuse."

Figure 1 shows the sensor components combined into one unit to indicate their interrelatedness. Two feedback signals may be seen arising from the unit,

and they are the aforementioned speech product and speech content feedback signals. The sensor unit in Figure 2 is represented by pictures of: a muscle representing the proprioceptive end organs, lips in contact representing tactile end organs, and the ear representing the auditory system. When visual feedback is active, an eye may also be included here.

To summarize this section . . . , the speech system is made up of five basic units: the receptor, integrator, transmitter, effector, and sensor units. Both integrator and transmitter units include storage components as well as corrector devices. The system has two outputs, namely, speech product and speech content.

SUMMARY

1. The speech system is described as a closed, multiple-loop system containing feedforward and feedback internal and external loops. Ten operations are described as possibly taking place during a full cycle of speech behavior; these are: thought propagation, word formation, thought pattern—word pattern comparison, word production, actual word product—desired word product comparison, word product—thought pattern comparison, internal, multiple-loop speech recycling, word product—listener reaction comparison, actual listener reaction—desired listener reaction comparison, and internal, and external, multiple-loop speech recycling.

2. Descriptions of the various functional components of the speech system's internal loop are presented. Figures of a cybernetic analogue of the speech system and an anatomical schema of the system are also presented. The speech system is described as being made up of five basic units: the receptor, integrator, transmitter, effector, and sensor units.

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PART III
COMMUNICATION THEORY: DECODING-ENCODING

One necessary condition for human communication is some form of monitoring of the environment. The process of decoding-encoding may be broadly defined as monitoring that involves the translation of signals into messages and messages into signals. In the encoding phase, the source of communication translates a message into signals which are then transmitted to a receiver; in the decoding phase, the receiver of communication translates the transmitted signal back into message form. In actuality, however, encoding and decoding occur simultaneously. One process is the inverse of the other; the ways in which the human brain changes signals into messages are identical to the ways in which the brain changes messages into signals. Knowledge gained about one process is knowledge gained about the other. The essays in this section focus on processes which are vital constituents of decoding-encoding: perception, attention, and physiological activity.

The process of perception is central to any act of interpersonal communication. Yet despite the flood of research on perception, there is neither a universally-accepted theory as to what is actually involved in perception nor is there general agreement as to how perceptual activities relate to human communication. One prominent theory, the transactional viewpoint, denies the independent existence of the receiver or his world. It stresses the role of learning in processes of perception and the primacy of perception as the basis of all social conduct. Hans Toch and Malcolm S. MacLean, Jr. clarify the transactional

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theory of perception and some of its implications for audiovisual communication in their essay "Perception and Communication: A Transactional View."

Magdalen D. Vernon in "Perception, Attention, and Consciousness" addresses the issue of human awareness. Professor Magdalen synthesizes a large body of research on the influence of set, training, emotions, stimulus conditions and physiological mechanisms upon the kinds of "messages" which affect one's attention and consciousness.

All of us are aware of how difficult it is to listen efficiently to a speech on radio or TV if someone else is simultaneously giving us complex information on a matter of importance to us. In an instance such as this we selectively attend only to relevant parts of the stimuli impinging upon us. J. Anthony Deutsch and D. Deutsch in "Attention: Some Theoretical Considerations," advance the theory that the decision as to what is relevant and irrelevant is handled by high-level cortical analyzing mechanisms. They develop a model that includes a mechanism which senses and directs attention to what the perceiver considers to be the most important stimulus at the moment.

E. D. Adrian in "The Human Receiving System" is primarily concerned with the problem of the final biological step in the transmission of stimuli between "the sense organ on the surface of the body and the brain inside the head." His essay lucidly points out the complexity and marvelous integrative capacity of the human receiving system.

PERCEPTION AND COMMUNICATION: A TRANSACTIONAL VIEW

Hans Toch and Malcolm S. MacLean, Jr.

The transactional approach to perception has relatively limited aspirations. It does not pretend to offer a systematic set of principles concerning the mechanics of the perceptual process. Instead, it supplies a point of regard or emphasis or perspective—or, if you please, a *bias*. This transactional bias has been described as (among other things) neo-Gestalt, neo-behaviorist, radical empiricist and common sense. None of these labels can be totally rejected, but reservations may be entered to all of them.

COMMON SENSE AND PERCEPTION

Of most interest is common sense: Perception viewed through the eyes of common sense is clearly a passive affair. The eye is the equivalent of a motion picture camera, and hearing functions in the fashion of a tape recorder. The chemical senses act in the manner of variegated litmus paper; the mechanical senses register physical weights and measures. In other words, perception unas-

sumingly transcribes on the slate of our awareness whatever the world presents to us. It dispassionately and uncritically records the gamut of bewildering impressions which reach us—mostly from without, but sometimes from within. This information, having been duly recorded, is then sorted, edited, and evaluated subsequently and—very importantly—elsewhere.

In due fairness, one must add that common sense, when passed, may admit that there is probably more to the story. The senses, for example, don't appear to receive impressions at random: the eyes must be directed at some portion of the world, and the glass of wine must be sipped before anything of consequence is perceived in either case. Moreover, there is obviously some measure of control over the quality of the product: the languid gaze, the shameless stare, and the vacant look don't transmit comparable data. Sophisticated common sense also discovers that there is some question as to whether we always perceive equally well. Assuming, for example, that the cochlea responds with the same precision when a person sits in a concert hall or in his living room immersed in his newspaper, everyone knows that auditory awareness clearly differs in these situations.

These and other observations of perception in action may suggest to common sense that the process is not altogether passive nor invariant. Perception seems to provide, within limits, the type of information the perceiver needs. Perception, in other words, is invoked, suppressed, and modified in the context of what the rest of the person is about. In order to be instrumental in this fashion, perception must be flexible and active. The vocabulary is full of words which imply recognition of this truism. The eye, for example, does not merely mirror or transmit; it scans, peeks, watches, stares, scrutinizes, and inspects. Such terms reflect a recognition of directionality, selection, or variability in perception.

TRANSACTIONAL DEPARTURE FROM COMMON SENSE

At this point, however, common sense assumes that it is the "user" of the perceptual process who is active, while perception itself is simply being manipulated. In other words, the perceptual apparatus is seen as subject to the same type of manipulation as the motion picture camera which may be switched on and off, variously aimed, and possibly even changed to different speeds at the whim of its owner and the flick of a switch. These manipulations, of course, would be viewed as extrinsic to the process of receiving and recording information. The transactional view does not accept this argument. It regards perception as continuously and inextricably enmeshed in the enterprise of living. Do we ever encounter perception as a "pure" process? Or, for that matter, can we conceive of a person behaving without perceiving? Is not behavior both an outcome of past perceptions and a starting point for future perceptions? And is not the "user" of perception himself a perceptual result? This conclusion would clearly follow from the fact that every human being is a product—a constantly changing product—of the situations through which he moves. Each encounter with life leaves its chink in the armor or its depression in the hide; the person who arises in the morning is

never the same one who returns to his pillow that evening. His successor may be broadened, chastised, wiser, or warier; his jaw may be more set or his brow more furrowed—more likely, he may see things a little differently or feel somewhat different. Whatever the change, it represents a deposit of perceptions and will, in turn, affect future perceptions.

Perception, then—in transactional parlance—is so wedded to the rest of the human enterprise that it has no meaning outside this context. If common sense finds this conception hard to deal with, the next step may prove even harder to take. Because unlike common sense, which assumes that a person perceives the world, the transactional view denies the independent existence of both the perceiver and his world. The term "transaction" was first used by Dewey and Bentley to distinguish this new view of epistemology from the common sense "interaction" conception. Dewey and Bentley summarize their transactional approach to perception by saying, "Observation of this general (transactional) type sees man-in-action not as something radically set over against an environing world, nor yet as merely action 'in' a world, but as action *of* and *by* the world in which the man belongs as an integral constituent (7:228)." Ittelson and Cantril illustrate the meaning of this statement by considering the case of a baseball batter:

It is immediately apparent that the baseball batter does not exist independent of the pitcher. We cannot have a batter without a pitcher. It is true that someone can throw a ball up in the air and hit it with a bat, but his relationship to the batter in the baseball game is very slight. Similarly, there is no pitcher without a batter. The pitcher in the bull-pen is by no means the same as the pitcher in the game. But providing a pitcher for a batter is still not enough for us to be able to define and study our batter. The batter we are interested in does not exist outside of a baseball game, so that in order to study him completely we need not only pitcher, but catcher, fielders, teammates, officials, fans, and the rules of the game. Our batter, as we see him in this complex transaction, simply does not exist anywhere else independent of the transaction. The batter is what he is because of the baseball game in which he participates and, in turn, the baseball game itself is what it is because of the batter. Each one owes its existence to the fact of active participation with and through the other. If we change either one, we change the other (15:3–4).

Another baseball analogy bearing on the meaning of the perceptual transaction is cited by Cantril, who quotes the following story about three umpires swapping views as to their professional function:

The first umpire said, 'Some's balls and some's strikes and I calls 'em as they is.' The second umpire said, 'Some's balls and some's strikes and I calls 'em as I sees 'em.' While the third umpire said, 'Some's balls and some's strikes but they ain't nothin' till I calls 'em (4:126).'

This story nicely illustrates the basic characteristic of the transactional view of perception, which may be summarized as follows: Each percept, from the simplest to the most complex, is the product of a creative act. The raw material for

this creation is lost to us since in the very act of creating, we modify it. We can never encounter a stimulus before some meaning has been assigned to it by some perceiver. Moreover, the perceiver himself becomes available to us only when he has entered into his task and has been modified in the process.

Both of these statements hold true because meanings are given to things in terms of all prior experience the person has accumulated. Therefore, each perception is the beneficiary of all previous perceptions; in turn, each new perception leaves its mark on the common pool. A percept is thus a link between the past which gives it its meaning and the future which it helps to interpret.

NEO-BEHAVIORIST VIEW

Perception, in other words, is a form of learning. This view makes it possible to speak of the transactional position as a neo-behaviorist approach. And transactionalism clearly approximates behaviorism not only in its emphasis on learning, but also in its conception of how learning takes place. According to behavioristic learning theory, learning is stimulated and strengthened by rewards (reinforcing situations) and inhibited by punishments or disappointments. The transactional conception is analogous. Each experience or perception helps to provide us with unconscious expectations or assumptions about reality. We expect the world to behave in accord with these assumptions. Like the data supplied in a racing form about the performance of horses under particular conditions, the accumulation of our past experiences provides the basis for bets as to success or failure of our intended enterprises. These bets are repeated or discontinued depending on whether they pay off or fail to pay off.

Just as a horse which has a long record of "wins" becomes a favorite and is assigned a high probability of success, certain interpretations come to be endowed with considerable confidence because of their repeated accuracy in the past. I have no hesitation in sitting down on what appears to me to be a chair, and I point my pencil at the paper in front of me with little doubt about the physical outcome. In other situations, however, past experience has not been as fully rewarding, and interpretations became long shots. The trustworthiness of friends, the reliability of colleagues, and the receptivity of students are not necessarily as punctually encountered as the seats of chairs. And even relatively simple perceptual dimensions such as size or distance may be incorrectly deduced—as has been the sad experience of many motorists. As a rule, however, perception results in confirmation, in the sense that our assumptions lead to successful conduct, thereby reinforcing our images of reality and our confidence in them.

GESTALTIST VIEW

The scheme we have just outlined differs from the thinking of students of learning only in its emphasis on personal experience, which behaviorism has traditionally refused to discuss. In turn, Gestalt psychologists, who share the trans-

actionalist bias favoring perceptual experiences as the basis of human conduct, reject the premise that such experiences are essentially learned. According to Gestalt thinking, the essential qualities of experience are, rather, built into the process of perception. The following statement by Wolfgang Köhler illustrates the Gestaltist rejection of the assumption that perceived meanings are acquired through past experience:

When I see a green object, I can immediately tell the name of the color. I also know that green is used as a signal on streets and as a symbol of hope. But from this I do not conclude that the color green as such can be derived from such knowledge. Rather, I know that, as an independently existent sensory fact, it has acquired secondary meanings, and I am quite willing to recognize the advantages which these acquired meanings have in practical life. In exactly the same fashion, Gestalt Psychology holds, sensory units have acquired names, have become richly symbolic, and are now known to have certain practical uses, while nevertheless they have existed as units before any of these further facts were added. Gestalt Psychology claims that it is precisely the original segregation of circumscribed wholes which makes it possible for the sensory world to appear so utterly imbued with meaning to the adult; for, in its gradual entrance into the sensory field, meaning follows the lines drawn by natural organization; it usually enters into segregated wholes (20:139).

Beside the difference, apparent in this quote, between the Gestalt emphasis on innate perceptual qualities as against the transactional stress on learning, there is another divergence in emphasis between these two views of perception. This difference rests in the fact that perception, in transactional parlance, is *functional*, in the sense that it exists to enable the perceiver to carry out his purposes, whereas Gestalt thinking sometimes assumes that man strives for veridicality or accuracy for its own sake.

There is, however, an even greater difference between the transactional premise that perception derives its meaning from the human enterprise and the contention of some people that needs and fears can shape perceptual products. Unlike these New Look theorists, the advocates of the transactional view do *not* assume that we tend to see steaks when hungry, or that we have difficulty in hearing threatening language. In fact, the transactional assumption would be that it is never in the long-run interest of people to see what they want to see or to fail to perceive what doesn't meet their fancy, just as the deer is not aided by failing to notice the jumping lion. The greatest survival value lies in accurate perception. The purpose of perception is to help us cope with the world by assigning meanings to it which can stand the test of subsequent experiences.

PERCEPTION AND COMMUNICATION

The above exposition of what—essentially—the transactional view is and is not, makes possible a few statements about perception which might have special bear-

ing on non-verbal communication. Sample experiments illustrating some of these statements may help clarify them:

SHARED EXPERIENCES RESULT IN PERCEPTUAL COMMUNALITIES

There are many types of experience which people have in common, almost by virtue of their human condition. These range from the elements of geometry to their intimate exposures to other human beings which create the beginning of social awareness. Common human experiences create similarities in perception and make possible easy communication. Universally shared meanings, in fact, are the *simplest* means of communication because they require little translation from one person's frame of reference into another. When A offers B a chair, when B smiles at C, or when C makes love to D, communication problems are minimized.

Probably the most famous of the "Ames Demonstrations" (so-called because they were originated by Adelbert Ames, Jr.) is the "Rotating Trapezoidal Window" Demonstration. This device helps to show the perceptual role of assumptions which have their origin in relatively universal human experiences. The demonstration consists of a trapezoidally-shaped window which can be slowly rotated, and which is invariably perceived as a rectangle (in perspective) oscillating from side to side. If a rod is placed in the window, it will appear to fold around it or to cut through it while the window is in motion. A box attached to one corner of the apparatus seems to take to flight. Why do those illusions occur? Ames himself offers this explanation:

In his past experience the observer, in carrying out his purposes, has on innumerable occasions had to take into account and act with respect to rectangular forms, e.g., going through doors, locating windows, etc. On almost all such occasions, except in the rare case when his line of sight was normal to the door or window, the image of the rectangular configuration formed on his retina was trapezoidal. He learned to interpret the particularly characterized retinal images that exist when he looks at doors, windows, etc., as rectangular forms. Moreover, he learned to interpret the particular degree of trapezoidal distortion of his retinal images in terms of the positioning of the rectangular form to his particular viewing point (2:14).

These assumptions about rectangularity are in most situations not apparent because they lead to accurate perceptions, so that the perceiver can argue, "I see X (rectangular) because it *is* X (rectangular)." The "trapezoidal window" reveals assumptions because it is deliberately designed to be misleading.

DIFFERENCES IN EXPERIENCES CAUSE PERCEPTUAL DIVERGENCE

The "trapezoidal window" depends for its effect on universal human experiences with rectangular objects in perspective. But are experiences such as these really equally shared by every human being? In the case of rectangularity, for instance, some people may be more intensively exposed to rectangular objects

than others. Zulu members of the Bantu culture in South Africa stand out as hav-
ing relatively little experience with man-made rectangles.

Huts are invariably round (rondavels) or else beehive shaped, whereas in other Bantu
tribes they are sometimes square or rectangular. Round huts arranged in a circular form
with round stockades to fence in animals, constitute a typical African homestead (kraal).
Fields follow the irregular contours of the rolling land, and never seem to be laid out in the
neat rectangular plots so characteristic of western culture. The typical Zulu hut has no
windows, and no word for such an aperture exists. In the more primitive beehive grass huts,
doors are merely round entrance holes; in the round mud huts, doors are amorphous, seldom
if ever neatly rectangular. Cooking pots are round or gourd-shaped . . . (1:106).

When tested with the "trapezoidal window," in a study by Allport and Pettigrew,
non-westernized Zulus tended to perceive the illusion less frequently—under sub-
optimal conditions—than did westernized persons who have more intensive ex-
perience with rectangularity (1). One can infer from this fact that differences in
experience, even in cumulative experience that is common to people, can create
subtle differences in the way the world is perceived.

PERCEPTUAL DIFFERENCES CAN BE READILY PRODUCED

Social psychologists are frequently concerned with attitudes, values, and
habits that are prevalent among groups of people and are transmitted from gen-
eration to generation. Less obviously, ways of perceiving also come to be ac-
quired and transmitted collectively. Two experiments, both involving a relatively
new research technique, may serve to illustrate this fact:

In 1955, a psychologist named Engel published a set of observations involv-
ing subjects who had been exposed to two different pictures—one to the left eye
and the other to the right (9). One effect he discussed is that of perceptual domi-
nance by more familiar pictures when they are paired with less familiar pictures.
"A 'right side up' face, for instance, tends to perceptually prevail over the same
face 'upside down.' "

This observation has given rise to a number of experiments, one of which
included matched Mexican and American observers. These persons were exposed
to several sets of pictures, in each of which a typically American scene (such as a
baseball game) was paired with a typically Mexican view (like a bullfight). The
investigator, Bagby, concludes:

Ss report scenes of their own culture as predominant in binocular rivalry over scenes from
another culture. The national cultural differences appear critical in affecting perceptual
predominance in the majority of the stereogram slide pairs . . . Differences in ways of per-
ceiving come about as a consequence of differences in past experiences and purposes. These
in turn emerge from influences in the home, in the school, and in the various groups with
which an individual identifies. Thus, under conditions of perceptual conflict as found in
the binocular rivalry situation, those impingements possessing the more immediate first-
person meaning would be expected to predominate in visual awareness (3:334).

This statement, of course, need not be confined to past experiences associated with different cultures. Subgroups in the same culture also frequently become differentially indoctrinated, and such differences in indoctrination should leave their mark on perception.

To test for this possibility, terminal candidates in a Midwestern police training program were presented with a set of slides, each of which featured a violent scene for one eye, and a similar but non-violent picture for the other. Beginning students in the training program and comparable liberal arts students served as control groups. The persons trained in police work saw a considerably larger number of "violent" pictures in this situation. The investigators comment:

Assuming that extremely violent scenes are comparatively unfamiliar, we would thus expect violence to be relatively infrequently perceived in true binocular rivalry. We would predict the type of result we obtained from our Control Groups. We could assume that law enforcement training *supplements* this experiential deficit in the area of violence and crime. Unusual experiences, after all, become 'familiar' in the course of *any* specialization. The funeral director or the medical intern, for instance, may learn to accept corpses as part and parcel of everyday experience. The dedicated nudist may acquire a special conception of familiar attire. The air pilot may come to find nothing unusual about glancing down out of a window at a bank of clouds. In the same fashion, law enforcement training can produce a revision of unconscious expectations of violence and crime. This does not mean that the law enforcer necessarily comes to exaggerate the prevalence of violence. It means that the law enforcer may come to accept crime *as a familiar personal experience*, one which he himself is not surprised to encounter. The acceptance of crime as a familiar experience in turn increases *the ability or readiness to perceive violence where clues to it are potentially available* (29:392).

Subtle perceptual differences of this sort, although universally present, only manifest themselves for our inspection under special conditions such as binocular rivalry. At other times, we may deal with people under the assumption that their perceptions coincide with ours, although in fact differences in past experience have produced fundamental divergences in outlook.

The same point holds true over time, since research shows that subtle *changes* in perception continuously take place without our being aware of them. To illustrate: Two photographs, each of a different face, were mounted in a stereoscopic device. When the observer first looked into the stereoscope, he was presented with just one of the faces with normal illumination. Then the illumination was cut. Next, he was given the first face normally lit, with the second face under very low illumination. The procedure was repeated with a slight increase in light on the second face, and so on until the subject was observing both faces each with the same normal light. At each step he was asked whether any change had taken place in what he saw. Most said they saw no change! But the second phase of the experiment was even more startling. In the same way, but small steps, the light on the first photograph was reduced to zero. At this point, the observer was

looking at the second face, quite different from the first. He continued to claim that no change had taken place, that he was still looking at the same face. Engel reports that observers were much perplexed when they were again presented with the original face (8).

ANY GIVEN EVENT IS DIFFERENTLY PERCEIVED BY DIFFERENT PEOPLE

The more complex a perceptual situation becomes, the greater the tendency for variations in perception to occur. Whereas a chair, for instance, provides a minimum of opportunity for differences in perception—at least, for members of our Western culture—any standard *social* situation constitutes a veritable perceptual cafeteria. This is the case not only because complexity multiplies the opportunity for the perceiver to assign meanings—for instance, one can choose to attend to one of many aspects of a complex situation in preference to others—but also because complexity usually evokes a wide gamut of personal experiences and needs which enter into the assignment of meaning.

Hastorf and Cantril illustrate this process in their study of the infamous football game between Dartmouth and Princeton which took place on November 23, 1951. The events which occurred in this game are conservatively catalogued as follows:

A few minutes after the opening kick-off, it became apparent that the game was going to be a rough one. The referees were kept busy blowing their whistles and penalizing both sides. In the second quarter, Princeton's star left the game with a broken nose. In the third quarter, a Dartmouth player was taken off the field with a broken leg. Tempers flared both during and after the game. The official statistics of the game, which Princeton won, showed that Dartmouth was penalized 70 yards, Princeton 25, not counting more than a few plays in which both sides were penalized (13:129).

The sequel of these events was a prolonged and intense exchange of recriminations between players, students, coaches, administrative officials, student publications, alumni and partisans of the two universities, each of whom claimed to have sustained the brunt of the injuries.

Hastorf and Cantril submitted a questionnaire concerning the game to both Princeton and Dartmouth students and alumni, the results of which confirmed the divergent position of the two sides relating to the game. A film of the game also was shown to some 100 students; it yielded widely discrepant reports of the number of infractions committed by each side and the seriousness of these infractions. The Princeton students, for instance, "saw" the Dartmouth team make more than twice the number of infractions "seen" by Dartmouth students in watching the same film. They also "saw" two "flagrant" to each "mild" infraction for the Dartmouth team, and one "flagrant" to three "mild" offenses for their own team, a ratio considerably dissimilar to that of ratings by Dartmouth students. Hastorf and Cantril conclude:

. . . the 'same' sensory impingements emanating from the football field, transmitted through the visual mechanism to the brain, obviously gave rise to different experiences in different people. The significances assumed by different happenings for different people depend in large part on the purposes people bring to the occasion and the assumptions they have of the purposes and probable behavior of other people involved (13:132). . . .

It is inaccurate and misleading to say that different people have different 'attitudes' concerning the same 'thing.' For the 'thing' simply is *not* the same for different people whether the 'thing' is a football game, a presidential candidate, Communism, or spinach. We do not simply 'react to' a happening or to some impingement from the environment in a determined way (except in behavior that has become reflexive or habitual). We behave according to what we bring to the occasion, and what each of us brings to the occasion is more or less unique (13:133).

ALL ASPECTS OF A PERCEPT ARE RELATED TO EACH OTHER

A fundamental discovery of Gestalt psychology was that the basic unit of perception is the organized configuration which the perceiver perceives. Perceptual objects, in other words, function as indivisible units. This statement extends beyond the geometric or formal properties of stimuli. Thus, the perceived motion of the Ames "trapezoidal window" results from its perception as a rectangle in perspective: Object-identification and movement-direction are dependent on each other.

Hastorf has shown that the perceived size of a white square can range widely, depending on whether it is identified as an envelope or a calling card (12). This perceived size, in turn, can determine the apparent distance of the figure from the observer.

Less obviously, positive or negative feelings can also determine perceived size and distance. Thus, G. H. Smith set out to determine whether "faces regarded as friendly or pleasant" would be seen as "larger than those regarded as unfriendly or unpleasant in order to appear opposite the same target post (27:47)." His findings confirmed these expectations. He concludes:

Ss responded to the meaning which faces elicited in this situation; and . . . this meaning emerged out of the assumptions, attitudes, expectations, purposes, and special sensitizations which Ss had acquired through experience. . . . The fact that 'pleasant' or 'liked' faces were made larger (closer) than others indicates that attributed meaning, rather than size of retinal image alone, determined the responses . . . perception of a human face literally changed before the eyes of the Ss as a function of alterations in beliefs, assumptions, etc. (27:60–61).

Another set of experiments showing a relationship between affective significance and the perceptions of physical properties was provided by the "honi phenomenon" (30). This effect was first observed in an Ames Demonstration known as the "monocular distorted room," which is a geometrically distorted structure that looks square when viewed with one eye. Since the room appears to be normal (although it is in fact distorted), any face viewed through a window of the

room becomes expanded or contracted. The "honi phenomenon" was born one day when this customary illusion did not materialize. The face which refused to change belonged to a New York attorney, and the viewer was his devoted wife. Subsequent investigation showed that it is not uncommon for newlyweds to perceive their marital partners as relatively unchanged when optical distortions have in fact taken place. Similar phenomena can occur involving other kinds of affects (as with amputees and authority figures). The lesson to be drawn from such instances is that the apparent physical properties of a percept cannot be divorced from its other connotations.

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PERCEPTION, ATTENTION, AND CONSCIOUSNESS

Magdalen D. Vernon

We tend to think that our ability to perceive what lies in front of us is so great that we can see the whole of it at a glance. Nevertheless, it often happens that we fail to perceive events taking place within the field of view; and if they are subsequently brought to our notice, we then say that we overlooked them because we were not attending. In fact, at any one moment we may perceive and be fully aware of only a small selection of the objects and events in the world around us. Some we may overlook altogether; others we may be aware of very dimly. At some times we attend only to a very small section of the field of view, as when looking down a microscope, and notice little outside that area. At other times, we perceive a wider field; we look to and fro, noticing first one thing and then another. Sometimes this is done rather inattentively; but on other occasions we may search the field of view eagerly and expectantly for a particular object or event.

It appears that there are many degrees or levels in the clarity and detail with which we are aware of our surroundings, varying from a precise and accu-

rate perception of that part of the environment upon which attention is concentrated and focused, to a very vague marginal awareness of its less important aspects, and even to a type of perception of which we are not directly aware, but which nevertheless affects our actions in some way. In some degree we can vary the direction and extent of our conscious awareness, making it more concentrated or more diffuse, or directing it to one part of the environment rather than to others. But the degree to which we can exercise this control is limited. It is greatly affected by the general state of alertness, or "vigilance" as it is sometimes called; by factors of motivation and interest; by learning and experience; and by features in the environment itself. But the totality of experiences of which we can be aware at any one moment seems to be limited. Thus if attention is closely concentrated on one task, irrelevant events are likely to be ignored. Again, if the eyes are fixated upon a single point in the field of vision in order that this area may be perceived accurately and in detail, then comparatively little of the surrounding area is perceived. It seems probable that we cannot attend to two events happening at one and the same moment, and perceive both of them clearly. Thus it was found that it was impossible to take in two pieces of information presented simultaneously, one visually and the other aurally (Mowbray, 1954). Unless the two different events can be combined in some way, one must be overlooked. But attention can alternate rapidly between two or more events. The time taken to switch attention from one thing to another is of the order of $\frac{1}{5}$th of a second. Again, a figure can take on two different aspects, as in alternating perspective figures, but perception of one aspect precludes perception of the other.

If we wish to obtain a general and not very detailed view of our surroundings, we can relax our concentration and look to and fro from one point to another. Then no one part of the surroundings is very clearly perceived, and some may be overlooked altogether. Commonly, of course, we avail ourselves of a succession of such instantaneous impressions. If the field of view is a wide one, we look from one point to another, searching for what we want to see. Or with a narrower field, we can pick out more detail, or correct our first erroneous impressions by a further study. However, there are occasions, as in a motor accident, when we have no opportunity to look again, and we may not have time to see even the important features of the situation, if these exceed our capacity to perceive them instantaneously.

Numerous experiments have been carried out to determine how much we can see at a single glance. If a number of black dots on a white background is exposed momentarily, an observer can estimate up to five or six accurately. With a larger number, he begins to guess and is often incorrect. He is particularly likely to overlook those which are furthest from the centre of the field of vision (Baker, 1958). But if the dots are arranged in groups, or combined together in some sort of pattern, he may perceive a much larger number. If he is shown, instead of simple dots, more complex forms which he is required to describe or

identify, then the number which he can perceive is reduced. But again, if the complex forms can be related together in some way, or "coded"—if they can be combined together like the parts of a pattern or like letters in a word—they may together produce corroborative or "redundant" information, and they will be perceived more readily.

Recently a good deal of experimental investigation has been carried out (see, for instance, Anderson and Leonard, 1958) on the effects of "redundancy" on perception, particularly of shapes or patterns which have no ulterior meaning like that of letters, digits, diagrams or pictures. The observer has to perceive what their actual shape is, and perhaps discriminate it from other shapes. Suppose that the shapes are symmetrical, or that the patterns consist of regularly repeated items. Then the same information about form is given twice over by a shape symmetrical in one direction, and four times over by a shape symmetrical in two dimensions. The knowledge as to its essential form can be gained more rapidly than from an asymmetrical shape, and for that reason it can be perceived more quickly. On the other hand, if the observer has to discriminate between similar shapes, his task may be harder when there is considerable redundancy, or repetition of pattern, because there are fewer differences between the shapes for him to discriminate. These facts are sometimes important in practical tasks involving discrimination of patterns, for instance, in radar displays. In ordinary perception of meaningful objects, however, there is much redundancy of information, that is to say, a large number of corroborative impressions which enable us to identify these objects very rapidly; and to continue to do so in conditions, for instance, of brief exposure or dim illumination, when some of the impressions are scarcely perceptible.

However, whatever the nature of the shapes or objects we wish to perceive, the total amount perceived at any one moment and the information derived from it are strictly limited. Broadbent (1958) has recently put forward the hypothesis that there is some type of "filter" operating in the central nervous system which allows certain information to penetrate to consciousness, while preventing the access of other kinds of information. That part of the information which cannot be attended to immediately may, however, be put into temporary storage. When we have disposed of what immediately concerns us, we may then either turn deliberately to consider the stored information; or it may enter consciousness spontaneously; or it may affect our subsequent actions without becoming fully conscious at any time. This storage is only a short-term affair, and the information stored may soon disappear if it is debarred from consciousness for any length of time. There are, however, certain situations in which we are unable to maintain concentration indefinitely upon the matters which most concern us; and others which we temporarily keep in the background at length insist on intruding and distracting our awareness from the task in hand. We shall return to these later.

Let us consider first the nature of the selective processes which determine

what will be most readily and accurately perceived and will tend to be focal in consciousness. And here we encounter what at first sight appears to be a paradox—that sometimes we perceive most readily familiar events to which we are well accustomed, while on other occasions it is the unusual and unexpected which erupts in consciousness. Much experimental work has demonstrated that in our normal everyday life, in circumstances which we encounter frequently, we come to expect the appearance of certain familiar objects and events; and we perceive what has the greatest probability of occurring in these circumstances. Now I think that this statement can be held to be valid in the following sense: At any one moment, the visual impressions on the retina and in the central nervous system are often too limited, vague and ambiguous to define exactly the objects to which they refer. Nevertheless, they provide cues which insofar as they corroborate one another may lead to inferences as to the nature of what is present— inferences based on expectations derived from past experiences which have taught us what it is most probable that we should perceive. Thus in fact we may believe ourselves to be aware of something on the basis of very inadequate sensory data—and perhaps of something which is not there at all. In an often quoted demonstration by Ames (1946), a trapezoidally-shaped window revolving about a vertical axis was perceived, especially in monocular vision, as a rectangular window oscillating to and fro. In another demonstration Ames showed what was called the distorted room, in which walls, floor and ceiling were slanted at various angles, instead of being at right angles to one another. But if viewed with one eye through a small hole in a screen, the sensory impressions were similar to those produced by a normal rectilinear room, and that in fact was what the observer perceived. There seems thus to be a tendency to "make sense" of what is perceived only partially, vaguely or momentarily; and "making sense" means that we perceive what may reasonably be inferred from our general knowledge of the situation to be the source of our sensory impressions. Indeed, it may be that we hardly perceive at all in the ordinary sense of the word; but we infer from the vague sensory impressions that what is there is a rectangular window or a rectilinear room, because there is a greater probability that we are being confronted with these objects than with a trapezoidal window or a distorted room.

But there are several ways in which the expectations of an observer may be altered, so that he no longer perceives what is most probable or most likely to be before him. His expectations may be modified if he is told to look out for certain things, or certain aspects of the situation. Numerous experiments have shown that an observer may be "set" to perceive by the instructions given him by the experimenter. When observers were told that they were going to be shown in a brief exposure words relating to "animals," and were then shown groups of letters such as "seal" and "wharl," they often reported words such as "seal" and "whale" (Siipola, 1935). But when they were told that the words would be related to "boats," they reported "sail" and "wharf."

If observers are instructed beforehand to attend particularly to one aspect of a complex field—a field, for instance, which contains numerous types of shape of different colours—they will report this aspect with greater accuracy than if they had not been so instructed. But they will be more likely to overlook the other aspects, and be able to report very little about them. If observers are asked to discriminate shapes, certain characteristics of which are irrelevant to their judgments, these judgments will also be slower and less accurate if the observers think that these characteristics may sometimes be relevant to their judgments; but there is no such effect if the observers are instructed beforehand that these characteristics can be disregarded as altogether irrelevant (Henneman, 1957). However, another experiment (Lawrence and Laberge, 1956) showed that in fact observers may perceive something of the characteristics of figures to which they have not been directed to attend. For a short period of time after the figures have been presented, the observers may be able to store in their memories these secondary aspects, but they soon forget them. In several experiments it has been found that similar results are obtained if the observer is told to respond to a particular shape shown with a number of other shapes, and is informed beforehand as to how many different shapes there will be. The smaller the number of possible alternatives from which he has to choose, the quicker and more accurate will be his perceptions. Thus these experiments all show that a "set" can be established to attend to some particular aspect of the field which "filters" perception and concentrates it upon one aspect rather than others; but nevertheless the latter need not be completely overlooked.

There is a number of situations in which expectation of what is most probable has been modified by learning, and the observer has been "set" by training to perceive aspects of the environment which he would otherwise have overlooked. We have all heard stories of native trackers who can perceive the spoors of wild animals in the jungle which are invisible to Europeans. In our own society, tea-tasters and wine-tasters learn to perceive qualities in tea and wine which are not apparent to the ordinary person. In many industrial occupations, people learn to grade materials from small, not easily perceptible characteristics. Now, there are two types of processes which may take place in perceptual learning: (1) improvement in the perceptual discrimination of particular forms or objects, or the differences between these; (2) a more general type of judgment based upon inferences made from what is perceived. Practice in the recognition and discrimination of particular forms can undoubtedly improve these processes. The observer may get to know the shapes of particular forms (see, for instance, Bevan and Zener, 1952) ; or his actual acuity may appear to improve because he learns to find and utilize finer and more accurate cues to discrimination (Bruce and Low, 1951). But it may be necessary with complex material to point out to the observer just what he is to notice. For instance, in learning to identify aircraft, observers will improve most quickly if they are shown just what are the

significant points of difference between different aircraft. But this type of train-
ing is usually specific to a particular situation or class of material; it does not
produce any general improvement in perception. It has sometimes been claimed
that practice in the discrimination of shapes will improve the ability to read let-
ters; but there is no reliable evidence for this. Again, practice in the rapid per-
ception of letters and words exposed momentarily may improve this ability, but
have little effect on ordinary reading.

    However, people may also be trained to utilize their percepts efficiently in
making judgments or inferences from them. Thus it has been shown that absolute
judgments of distance could be improved when the observers were taught how to
break up long distances into smaller units which they then judged directly in
yards (Gibson *et al.,* 1955). Such judgments can usually be improved by teach-
ing observers to note certain cues in the situation against which they can match
their percepts; and the method of judgment can often be generalized to a variety
of similar situations. In all these forms of learning, the essential feature is that
something is perceived which was not noticed before; and insofar as the observer
practices concentrating his attention upon that characteristic, so in time he will
come to notice it automatically without further difficulty.

    There are circumstances, however, in which people spontaneously perceive
certain things or certain aspects of the field of view particularly readily. If they
have strong feelings about what is shown them or if they desire to perceive or to
avoid perceiving something, then not only is the speed of perceiving altered; they
may even think they perceive what is not actually there—or if they don't want to
see it, they may fail to do so when it is, as we say, staring them in the face. Ex-
periments have been carried out (Sanford, 1936, and Levine, Chein and Murphy,
1942) in which hungry observers were shown pictures of food, or objects related
to food, for brief periods of time, or partially obscured. They perceived the food
objects more quickly than observers who were not hungry; and also thought they
saw food when no pictures of food were shown them. However, in some cases, as
they became hungrier and hungrier, they identified fewer of the pictures, pre-
sumably because their need for food was not in fact satisfied by merely perceiv-
ing pictures of it. But the fact that we perceive more quickly something we are
motivated to see does not mean that we necessarily perceive more correctly. In
everyday life, if we find that in such circumstances we are mistaken, we may be
able to rectify our mistakes by looking again. But one experiment showed that
observers who were rewarded for guessing the identity of a single shape picked
out from a large scattered group of shapes did not become more accurate at this
task; they merely made more incorrect guesses (Boynton, 1957).

    The influence of emotions and desires on perceiving also appears in our ev-
eryday life perceptions of other people. We perceive most clearly and remember
in most detail the faces of those in whom we are interested, and notice less clearly

the faces of those to whom we are indifferent. A group of white American students who were favorably disposed towards Negroes perceived and recognized photographs of Negroes more correctly than did students who were unfavorable in their attitudes (Seeleman, 1940). The former perceived the faces in the photographs as those of particular individuals, with clearly differentiated individualities. The latter lumped them together as "niggers," and therefore saw little recognizable difference between them. But in another experiment (Secord *et al.*, 1956) it was shown that a group of people prejudiced against Negroes accentuated the differences between Negroes and whites in characteristics such as width of nose, fullness of lips, etc., to a greater extent than did a group of non-prejudiced people. . . .

Sometimes . . . perception appears to be retarded by unpleasantness or anxiety associated with the material which is being perceived. . . . Several experiments have been devoted to what has been termed "perceptual defense." Observers were shown in brief exposure sexual words which are taboo in polite conversation; and it appeared that many of the observers were slower to perceive these than to perceive neutral words which have no such connotation (see Bruner and Postman, 1947). It was hypothesized that these taboo words were perceived without their reaching consciousness, and were then refused entry to full consciousness because they would provoke disgust or anxiety. But it may be that the observers were unfamiliar with some of the words; or else they guessed what they might be, but rejected their guesses on the score that it was unlikely that such words would have been shown them; or else they knew what they were, but were shy of uttering them. When these various possibilities were eliminated, it was often found that the taboo words were perceived as quickly as the neutral ones. Indeed, in some cases observers exhibited "perceptual sensitization," and perceived the taboo words more readily than the neutral ones.

There are other situations in which "perceptual sensitization" seems to occur; when highly significant events appear to have a "prior entry" and to force themselves into consciousness without their being any preliminary expectancy or state of desire in the observer. We all know the rapidity with which we perceive a sudden bright light or a loud noise, a blow or other painful stimulus; and how we immediately take action, by starting, jumping aside, shielding our eyes or ears. Now it might be argued that it is the great intensity of these stimuli which ensures that they shall blot out everything else and rapidly enter consciousness. Intensity may indeed be one of the factors concerned, but there is evidence to show that it is not the only one, and that these stimuli are significant also because they constitute a potential threat to us, and it is important that we take immediate action to avoid them. Thus intense stimuli, if repeated or prolonged, may cease to be central in consciousness. It is possible to ignore the loud noise of traffic in the street outside, and even sleep in spite of it, but to awake immediately at the sound of someone opening the bedroom door. Therefore it appears

that suddenness and unexpectedness may be the important factors in bringing these events to consciousness. Again, we may quickly become aware of a sudden change in the perceptual field, and especially of rapid movement, without at first perceiving *what* is changing or moving. But once it is realized that there is something unexpected or incongruous in the field of view, then the tendency is to devote more attention to that part of the field than to its more familiar and humdrum aspects (see Berlyne, 1957, 1958).

From these observations we may then predict what are the situations and events of which we are least likely to become aware, and which we find most hard to attend to over any length of time. These are, first, stimuli which are very brief, very dim (because they are blurred or dimly illuminated) or situated at the margin of the field of vision. Secondly, they are situations which remain comparatively unchanged over long periods of time. We all know that if the intensity of a light or a sound is reduced sufficiently we cease to be able to perceive them. If we have cause to make a considerable effort, we may continue for a time to perceive them; but no effort nor desire, however strong, will make them perceptible below a certain minimum intensity—which is termed the "threshold intensity." Much experiment has been devoted to measuring the physical values of the threshold intensities for light and sound. It has been shown that these values are comparatively constant, in favorable conditions, but not completely so. It seems that awareness of such stimuli fluctuates; at one moment they can be perceived, but not at the next. The cause of this fluctuation lies probably in the nature of the physiological mechanisms of sensation. However, it is also true that different observers vary in the consistency with which they report that a stimulus of low intensity has appeared or disappeared; experience in making these judgments usually produces an increase in consistency.

Nevertheless, evidence has been obtained in recent years to show that events of which observers are not consciously aware may yet influence their thoughts and actions. An instance of this may be the phenomenon of "perceptual defence" which we have already considered. One experiment (McGinnies, 1949) appeared to show that before the observer became sufficiently aware of taboo words to be able to report them, he yet gave a psychogalvanic reflex response to them. (This is a reflex decrease in the resistance of the skin to an electric current, which occurs as part of the response of the autonomic nervous system to painful and emotional stimuli.) In another experiment, nonsense syllables, some of which had previously been associated with electric shocks, were presented for perception during brief intervals of time (Lazarus and McCleary, 1951). Psychogalvanic reflex responses occurred when the previously shocked nonsense syllables were shown, before the observer perceived what the nonsense syllables were. It was claimed that a process called "subception" was taking place, setting up responses of the autonomic nervous system to stimuli with painful associations, even when

these were not consciously perceived. However, it is possible that the observers did in fact see parts of the nonsense syllables, though not enough to report them correctly. But evidence of a similar kind has been obtained by Dixon (1955), that is to say, of psychogalvanic reflex responses to sexual words which were presented below threshold intensity, and were therefore never consciously perceived.

Now it has been shown that even in sleep psychogalvanic responses may appear not only with loud noises, but also with faint but significant sounds such as the whispering of the observer's name (Jung, 1954). This may happen without the observer waking; or if he does wake, he does not remember what stimulated him. The psychogalvanic response is nevertheless accompanied by changes in the natural brain rhythms of sleep, as shown in the electroencephalogram, changes such as characterize the transition from sleep to wakefulness. Thus clearly there is a mechanism in the brain which can respond to certain types of stimulation, of potential importance to the individual, and although he does not become aware of their precise nature, yet his autonomic nervous system may react to them as to an alarm or emotional threat.

But Dixon (1955) also obtained evidence as to other effects produced by "subliminal stimulation," that is to say, by stimuli below threshold intensity, but only just below. His observers were asked to say the first words that came into their minds when each of the stimulus words was presented subliminally; and often they responded with words which had some meaningful association with the stimulus words. With the sexual words, this sometimes had a Freudian character. Again, the observers were frequently able to associate their responses to the corresponding stimulus words when these were shown them subsequently. In other experiments Dixon found that such associations occurred only when they had been long established by use and familiarity. All these effects were more likely to occur if the observer had been instructed beforehand to expect that he was being stimulated in this way. Even when there was no such instruction, the observers were concentrating upon the task of guessing, so that there was little competition from other forms of conscious perception.

There are other situations in which the observer has apparently not been fully conscious of an event at the time of its original occurrence; but he has in fact perceived and remembered it, and it has reappeared more or less consciously somewhat later. Thus in the phenomenon called "incidental memory," an observer perceives events, is not directly conscious at the time that he has done so, but nevertheless acts in such a way later as to show that he had in fact registered them. In an experiment by Belbin (1956), road safety propaganda posters were hung on the walls of a waiting room in which observers sat for three minutes before they went into another room to be tested. Although they all seemed to have realized that there were posters in the waiting room, they neither preceived nor recalled them as such with any accuracy. But they were then tested to discover if they could apply the warnings given in these posters by picking out from photo-

graphs of traffic scenes any faults they could see in relation to road safety—such as pedestrians failing to give way to traffic which had been signalled on by a policeman. Now it was found that car-drivers picked out from the photographs significantly more faults suggested by the posters than did non-drivers. This was not due simply to their driving experience, since a control group who had not seen the posters did not show the effect. But apparently the drivers, set by their driving experience to assimilate warnings of this kind, did in fact register them and act on them though they were not fully conscious of having perceived them. . . .

We must now consider the situations in which perception is at first reasonably clear and accurate, but later ceases to be so. This seems to occur particularly when the observer is required to perceive a long series of very similar events, and when there is comparatively little change in the external situation over a long period of time. Such a situation was that in the "clock test" designed by Mackworth (1950). A pointer rotated in successive small jumps, one every second, round a dial like that of a clock; and at irregular and comparatively infrequent intervals it made a double jump. Observers had to notice and signal each of these double jumps by depressing a key. After only about half-an-hour, they began to miss the double jumps; and the number missed increased, throughout a two-hour period. Efficiency could be maintained, however, by increasing motivation; and by signalling to the observer every time a double jump had occurred, telling him whether or not he had responded to it.

However, the perceptual characteristics of such tasks are also important in maintaining efficiency of response. In an experiment in which observers had to report the occurrence of the 'echo' on a mock-up radar screen, there was a sharp decline in efficiency when the echo was dim and difficult to see, but relatively little decline when it was bright and clear (see Broadbent, 1958). Lengthening the time over which a signal is visible and increasing its frequency and regularity of appearance may also prevent decline, because the observer can expect when it will occur. But a simultaneous loud continuous noise enhances the decline. These experiments thus demonstrate that a decrease in "vigilance" and awareness of repeated signals may occur in a monotonous serial task, but this decrease may be prevented by certain methods of emphasizing the signals or making them clearer. Broadbent (1958) has explained these effects as being due to an inability to maintain any concentration of awareness on a relatively unimpressive and unchanging situation over a long period of time. Sooner or later there occur blockages in perception, and a wandering of attention to other features of the environment or to the observer's own thoughts, and an event occurring during this period goes unnoticed—though this is less likely to happen if the event is expected. The shorter the duration of the signal, the more likely is it to occur in one of these blockages, and therefore to be overlooked. But presumably the wandering is prevented by more frequent and more intense stimuli. Again, a paced task such

as that of the clock test is more affected than is an unpaced task in which signals remain on view for a considerable period of time. Thus in another experiment (Broadbent, 1958), an observer had to make a response to any one of twenty dials which showed a "danger" reading. The "danger" reading continued to be visible until the observer had responded to it, that is to say, until any temporary lapse of attention had disappeared. There was some oscillation of vigilance, but no overall decrease.

Again, we know from earlier experiments on the deterioration of performance of aircraft pilots during long periods of work (see Bartlett, 1943), that in these circumstances attention wanders to an increasing extent from signals on instrument dials. But it is important to note that this occurs not only as the result of general fatigue, but also from repetitiveness and lack of variation in perceptual stimulation. The application of these findings to the performance of monotonous tasks is obvious; and Colquhoun (1957) has begun a study of the factors which are most likely to produce loss of vigilance in industrial inspection tasks. . . .

The psychological evidence as to variations in conscious awareness which occur in various types of perceptual situations and with varying degrees of attention has been related in recent years to certain physiological processes occurring in the central nervous system; and especially to the functions of a particular type of nerve tissue in the subcortical region of the brain called the "reticular formation." The activities of this appear to be associated with the arousal of awareness, the maintenance of vigilance and the direction of attention to specific events (see Jasper, 1957, and Samuels, 1959). The functions of the reticular formation seem to be two-fold. In the first place, one part of it appears to be concerned with general arousal and wakefulness. Impulses from this part inhibit the spontaneous activity of the cortex which occurs in the long, slow, synchronous rhythms appearing in the electroencephalogram during sleep; and these rhythms are replaced by the more rapid alpha rhythm which characterizes waking states in which attention is relatively relaxed; and which in turn is blocked by direct sensory stimulation or when attention is aroused. The reticular formation is itself stimulated to action both by impulses arriving through collateral fibres from the sensory nerve tract; and also by impulses coming from the cortex. The latter arise particularly in sudden and unexpected stimulation of the cortex, and their effect appears to be relatively temporary. After partial arousal to wakefulness, repetition of stimulation produces habituation, arousal is inhibited and sleep restored. Injuries to the reticular formation produce a condition of lethargy or coma in animals, which cannot then be aroused.

But another part of the reticular formation appears to be concerned with more specific alerting to particular sensory stimuli. Impulses from this part may interrupt and re-set the general pattern of cortical excitation; enhance or recruit

discharges in specific areas of the cortex; and inhibit discharges in other areas. In visual stimulation, they block the alpha rhythm of the visual areas of the cortex. This part of the reticular formation is also stimulated by impulses through collaterals from the specific sensory pathways. It is affected to the greatest extent by pain impulses; and auditory impulses produce more effect than do visual ones. These differences would appear to reflect the relative degree of attention paid to these different sensory modes.

The activities of this part of the reticular formation are also very closely geared to and dependent upon impulses from the cortex. Sensory impulses passing up the direct pathways to the cortex travel at higher speeds than those proceeding through collaterals to the reticular formation. Thus there is time for the cortex to evaluate the former and to discharge downwards to the reticular formation, regulating its reactions to the sensory impulses it received through collaterals. Its facilitatory activities may then be directed towards percepts significant to the the individual, and its inhibitory activities towards irrelevant percepts, producing an enhancement of discrimination. Such an enhancement has been demonstrated in an experiment in which people were required to distinguish between two successive flashes of light (Lindsley, see Jasper, 1957). It was found that the temporal interval necessary for discrimination between the flashes was shortened by direct stimulation of the reticular formation.

We may then infer that although the direct sensory pathways transmit the information which forms the actual content of consciousness, the degree of awareness of this and the manner in which it is discriminated depend on the activities of the reticular formation. This is demonstrated by the effects of stimulation by barbiturate drugs. The activities of the reticular formation are depressed and inhibited by concentrations of these drugs which are insufficient to affect direct responses of the sensory areas of the cortex. Thus an individual may continue to be aware of sensory stimulation after he has lost the power to attend or discriminate.

The functions of the reticular formation have also been shown to be affected by impulses from those areas of the cortex specifically involved in motivational and emotional states. General arousal, specific anticipatory "set" and attentive searching with the eyes, followed by exploratory behavior, are set up through the activity of the reticular formation. Similar effects have been demonstrated by direct electrical stimulation of the reticular formation in monkeys. Thus mild stimulation produced the arousal of sleeping monkeys and the attention and alerting of waking animals, with inhibition of voluntary movement. Higher intensities of stimulation produced fear reactions of cowering and avoiding; still higher intensities, panic flight. Strong electric shocks to the area of the cortex associated with motivational and emotional functions may, however, result in a complete blockage of activity in that part of the reticular formation concerned with specific alerting and attention. This effect seems to parallel the breakdown

of discrimination which takes place in states of violent emotion; it may even occur in a mild form in "perceptual defense." . . .

This evidence as to the functions of the reticular formation appears to show that there are two separate and distinct processes which can occur in our reactions to the environment: first, a general and non-focal perception or registration of the environmental field or some part of it, which may include little or even no conscious awareness; and secondly, a focalized attention to some particular part of the field, accompanied by maximal conscious awareness. The latter process has been likened to a "spotlight" focused upon a small area of the field, the remainder of which is only dimly lit. The greater the degree of attention, the greater the clarity in the awareness of that part which is attended to. But although in such conditions perception is generally rapid and accurate, it can nevertheless take place also when there is little or no attention; and the precise relationship between perception and attention is difficult to define or determine.

The concept of a spotlight focused upon a particular area of the field is obviously applicable to situations such as those in which an observer is required to perceive and report the number and nature of objects exposed in a small area for a brief period of time. In such circumstances, the amount perceived is certainly limited by the maximal attentive and receptive capacity of the observer. But whether this capacity is exercised to the full is partly a function of physical conditions such as the brightness, contrast, heterogeneity and form qualities of the field; and also of factors in the observer himself related to his expectations as to what will appear and his ability to "code" the information supplied him and to assimilate its meaning. But also it seems that no one is capable of exercising his full capacities for attention and perception over more than a limited period of time in a relatively unchanging environment, apparently through some process of habituation or self-inhibition in the functions of the reticular formation.

However, we have seen that perception is by no means limited to that part of the field upon which attention is maximally focused. Observers are certainly aware of something in the surrounding areas of the field, though it is difficult to determine at all exactly what and how much is perceived; how much is remembered and for how long; and what effect it has on the observer's thoughts and behavior. But we have noted that in some cases aspects of the field appear to be registered in such a way as to produce effects even when the observer is barely conscious of having perceived them, or is not conscious of them at all. Again, parts of the field may be perceived in varying amounts and with varying correctness when attention is not focused—when it is extremely diffuse, and the observer allows it to wander in an undirected fashion over the field. It seems that in these circumstances certain objects or events in the field may "arrest" attention, which will then be focused upon them. These events may possess characteristics such as intensity, vividness or sudden appearance which cause this effect. Or they

may appeal to the observer's desires or interests, or may be a potential threat of danger to him. But we also have the paradoxical situation in which certain events which might cause anxiety or unpleasantness are apparently excluded from consciousness. Possibly, in the first case the general arousal function of the reticular formation is stimulating a general alerting of consciousness to the situation as a whole; whereas in the second case specific attentive discrimination is inhibited by a downward discharge from the cortex in response to emotional shock.

However, in all these cases some process of "filtering" appears to take place below the level of consciousness, which allows certain percepts to penetrate to full consciousness, and directs attention upon them; whereas other percepts are marginally conscious and are stored for a while until we can attend to them; yet others never become more than vaguely conscious. But the marginal percepts may in fact have considerable effect on behavior, particularly upon the more automatic types of behavior. The type of "filtering" and the direction of attention vary according to the significance of the situation to the observer, and are subject to the effects of learning. It has been hypothesized that the functions of the reticular formation itself may be modified considerably by learning; but more evidence is required to determine the manner in which this takes place.

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ATTENTION: SOME THEORETICAL CONSIDERATIONS

J. Anthony Deutsch and D. Deutsch

There has, in the last few years, been an increase in the amount of research devoted to the problem of attention, which has been summarized in Broadbent's (1958) important work. Whilst psychologists have been investigating the behavioral aspects of attention, suggestive evidence has also been found by neurophysiologists. We feel that it would be useful at this time to consider the theoretical implications of some of this research.

Our paper is divided into three parts. In the first we consider some of the behavioral findings on attention. In the second a system is proposed to account for various features of this behavior. Although we do not consider it necessary to identify a system of this type with particular neural structures (see Deutsch, 1960) since a machine embodying such a system would also display the behavior we wish to explain, we do, however, venture some tentative hypotheses concerning the neural identification of the proposed system.

BEHAVIORAL CONSIDERATIONS

However alert or responsive we may be, there is a limit to the number of things to which we can attend at any one time. We cannot, for instance, listen effectively to the conversation of a friend on the telephone if someone else in the room is simultaneously giving us complex instructions as to what to say to him. And this difficulty in processing information from two different sources at the same time occurs even if no overt response is required. This phenomenon of selective attention has been investigated in a number of experiments. The most important of these deals with the processing of information emitted simultaneously by two separate sound sources (Broadbent, 1954; Cherry, 1953; Spieth, Curtis, and Webster, 1954). Two problems arise from the results of such experiments. The first is how different streams of information are kept distinct by the nervous system, and how a resultant babel is thereby avoided. The second is why only one of the messages (once it has been kept distinct and separate) is dealt with at any one time. A proposed solution to the first problem, based on experiments in which two messages were fed simultaneously one to each ear, was that the messages were kept distinct by proceeding down separate channels (such as different neural pathways). Nor was it difficult for Broadbent (1958) to extend such a notion to other cases. It had been shown in numerous experiments that we are enabled to listen to one of two simultaneous speech sequences while ignoring the other, by selecting items for attention which have some feature or features in common, such as their frequency spectra (Egan, Carterette, and Thwing, 1954; Spieth *et al.*, 1954) and their spatial localization (Hirsch, 1950; Poulton, 1953; Webster and Thompson, 1954). It was supposed that relatively simple mechanisms were responsible for segregation according to these categories, though the principles of their operation were not made clear.

Broadbent's (1958) answer to the second problem, of how one message is admitted to the exclusion of others, followed from the notions we have already considered. It was proposed that there was a filter which would select a message on the basis of characteristics toward which it had been biased and allow this message alone to proceed to the central analyzing mechanisms. In this way, messages with other characteristics would be excluded and so the total amount of discrimination which would have to be performed by the nervous system would be greatly decreased. Whole complex messages could be rejected on the sole basis of possessing some simple quality, and no further analysis of them would occur.

However, it seems that selection of wanted from unwanted speech can be performed on the basis of highly complex characteristics. For instance, Peters (1954) found that if an unwanted message is similar in content to the wanted

one, it produces more interference with the adequate reception of the latter than if it is dissimilar to it. This shows that the content of the two messages is analyzed prior to the acceptance of one and rejection of the other. Gray and Wedderburn (1960) have also found that when speech was delivered to subjects in both ears simultaneously, such that a meaningful sequence could be formed by choosing syllables or words alternately from each ear, the subjects reported back the meaningful sequence rather than the series of words or syllables presented to one ear or the other. Treisman (1960) presented two messages, one to each ear, and subjects were asked to repeat what they heard on one ear. The messages were switched from one ear to the other in the middle and it was found that subjects tended to repeat words from the wrong ear just after the switch. "The higher the transition probabilities in the passage the more likely they were to do this" (Treisman, 1960).

Other evidence, indicating that complex discriminations would be required of the filter, has been produced by experiments concerning the selection of novel stimuli, for which function Broadbent (1958) assumes the filter to be responsible. Sharpless and Jasper (1956), studying habituation to auditory stimuli in cats, found that habituation, both behavioral and EEG, was specific not only to the frequency of sound presented, but also to the pattern in which a combination of frequencies was presented. Evidence for human subjects is presented by Sokolov (1960) and Voronin and Sokolov (1960), who report that when habituation has been established to a group of words similar in meaning but different in sound, then arousal occurred to words with a different meaning. Behavioral data on the arousal of curiosity in rats upon the presentation of novel visual patterns are reported by Thompson and Solomon (1954).

Such evidence as the above would require us, on filter theory, to postulate an additional discriminative system below or at the level of the filter, perhaps as complex as that of the central mechanism, to which information was assumed to be filtered.

Howarth and Ellis (1961) have presented an ingenious experimental argument to show that the same discriminatory mechanism functions in normal perception and when, on filter theory, the discrimination would have to be performed at the level of the filter. The case they put forward is as follows. Moray (1959) had shown that if a subject is listening selectively to one channel and ignoring the other, calling his name on the rejected channel will on a certain proportion of instances cause him to switch his attention to this channel. This was explained by assuming that the subject's name had a higher priority for the filter than the message to which he had been attending. Oswald, Taylor, and Treisman (1960) in a well-controlled experiment reported that during sleep a subject tends to respond selectively to his own name. Howarth and Ellis (1961) went on to show that the subject's name has a significantly lower threshold than other names when the subject is required to listen normally and there is masking by

noise. After analyzing quantitatively their results and those obtained by Oswald et al. and Moray, they (Howarth and Ellis, 1961) conclude that,

There is, therefore, a very impressive amount of agreement among these three very different experiments concerning the relative intelligibility of one's own name. It seems an obvious conclusion to suppose that the same pattern-analyzing mechanism is required to account for behavior during dichotic listening or during sleep . . .

as during ordinary listening under noise. Thus although Broadbent's (1958) filter provides an ingenious explanation of the selection of messages by means of simple and few discriminations, such as which ear is being stimulated, it becomes less attractive as an explanation of those cases where complex and many discriminations, discussed above, are needed.

    If we may identify levels in filter theory with neural levels, then there is also evidence against a two-level system to account for novelty and habituation on neurological grounds. Sharpless and Jasper (1956) found that specificity of habituation to tonal pattern was destroyed by bilateral regions of cortex concerned with audition. It is known from other work (Goldberg, Diamond, and Neff, 1958) that sound pattern discrimination is a cortical function. On the other hand, frequency specific habituation was maintained with Sharpless and Jasper's lesions and it has been shown that frequency discrimination can be taught to animals without these cortical areas (Goldberg *et al.*, 1958). This shows, first, that the level at which habituation occurs is not the same for both pattern and tone, and second, that the destruction of the level which is essential to normal functioning also destroys an animal's ability to habituate. This renders it plausible to assume that the mechanism responsible for habituation is not on a different level from that responsible for other learning and discrimination.

THEORETICAL CONSIDERATIONS

This review of the behavioral evidence leads us to the probable conclusion that a message will reach the same perceptual and discriminatory mechanisms whether attention is paid to it or not; and such information is then grouped or segregated by these mechanisms. How such grouping or segregation takes place is a problem for perceptual theory and will not concern us here. We may suppose that each central structure which is excited by the presentation of a specific quality or attribute to the senses, is given a preset weighting of importance. The central structure or classifying mechanism with the highest weighting will transfer this weighting to the other classifying mechanisms with which it has been grouped or segregated.

    The main point with which we are concerned is the following. Given that there is activity in a number of structures, each with a preset weighting of impor-

tance, how might that group of structures with the greatest weighting be se-
lected? Or, in behavioral terms, how might the most important of a group of sig-
nals be selected? Any system which performs such a function must compare all
the incoming signals in importance. This could be done by comparing each in-
coming signal continuously to every other incoming signal and deciding which is
the most important by seeing which signal has no other signal which exceeds it
in the physical dimension by which "importance" is represented. But a small
amount of reflection will suffice to show that such a system is very uneconomical.
Each possible incoming signal must have a provision in the shape of numerous
comparing mechanisms, through each of which it will be connected to all other
possible signals. So that as the number of possible signals increases, the number
of mechanisms to compare them all against each other will increase at an enor-
mous rate. If the same comparing mechanisms are to be shared by pairs of sig-
nals then the time to reach a decision will increase out of all bounds.

However, there is a simpler and more economical way to decide that one out
of a group of entities is the largest. Suppose we collect a group of boys and we
wish to decide which is the tallest. We can measure them individually against
each other and then select the boy in whom this comparison procedure never
yielded the answer "smaller." This is like the system outlined above. The deci-
sion smaller will be made in this case when we lower a horizontal plane or ruler
down on the heads of two boys. The boy whose head is touched by this instru-
ment is declared to be larger and the other boy smaller. But such a procedure is
cumbersome because there are many pairs of boys and we must scan through
many records of individual boys before we can select the tallest. We could, of
course, argue that a simpler solution would be to use an absolute measure of
height, such as a ruler with feet and inches inscribed on it. But this procedure is
not really simpler. Each boy must be compared against the ruler, and then the
measurements themselves must be compared against each other in much the same
way as the boys were to decide on the larger and smaller in each couple.

If we are simply interested in finding the tallest boy, then an alternative
procedure may be used. Suppose we collect our group below our board which is
horizontal and travels lightly up and down, and then ask all our group to stand
up below it. Then the boy whose head touches the board when the whole group is
standing up will be the tallest boy in the group. If then we call him out, the
board will sink until it meets the head of the next tallest individual. If we intro-
duce some other boys into the group, then if there is a taller boy in this group
the board will be raised until it corresponds to his height. In such a system only
the tallest individual will make contact with the board, and so he will himself
have an immediate signal that he is the tallest boy.

Now suppose that instead of boys, we have signals, not varying in height,
but in some other dimension (which we may continue to call "height") which
corresponds to their importance to the organism. Suppose that each signal as it
arrives is capable of pushing some "level" up to its own "height" (the height

determined by its importance), then the most important signal arriving at any particular time will determine this level, analogous to the horizontal board in our example. It will then be the case that any signals which arrive then or after and are of lesser importance and so of smaller height will be below this level. However, if the signal of greater height ceases to be present, then the level will sink to the height reflecting the importance of one of the other signals which is arriving.

If we suppose that only signals whose height corresponds to the height of the level switch in further processes, such as motor output, memory storage, and whatever else it may be that leads to awareness, we have the outline of a system which will display the type of behavior we associate with attention. Only the most important signals coming in will be acted on or remembered. On the other hand, more important signals than those present at an immediately preceding time will be able to break in, for these will raise the height of the level and so displace the previously most important signals as the highest.

So far we have omitted any discussion of the role of general arousal in selective attention. Without such arousal, usually (but not invariably, Bradley and Elkes, 1953; Gestaut, 1954) indicated by characteristic patterns on the electroencephalogram, awareness of and behavioral responsiveness to peripheral stimulation are absent. Some degree of general arousal is thus necessary for attention to operate. Furthermore, individuals when aroused will attend to any incoming message, provided that it is not concomitant with a more important one, whereas when asleep they will only respond to very "important" messages, such as a person's own name (Oswald *et al.*, 1960) or, in the case of a mother, the sound of her infant crying. And when drowsy, though responsive to a larger range of stimuli than when asleep, subjects will tend to "miss" signals which they would notice when fully awake.

The system which takes this into consideration is schematically represented in the diagram (Figure 1). Any given message will only be heeded if the horizontal line (Y) representing the degree of general arousal meets or crosses the vertical line, the height of which represents the "importance" of the message. Whether or not alerting will take place then depends both on the level of general arousal and on the importance of the message. Attention will not be paid to Message b though it is the most important of all incoming signals, when the level of general arousal is low (Position X). When the level of general arousal is at Z, which is very high, attention could be paid to all signals a, b, c, d, and e. In fact, attention is paid only to b as a result of the operation of the specific alerting mechanism.

Further, it is supposed that a message will increase the level of general arousal in proportion to its importance and for various lengths of time in proportion to its importance, so that messages which would not have been heeded before will command attention if they follow in the wake of a more important message.

The mechanism whereby the weighting of importance of messages is carried
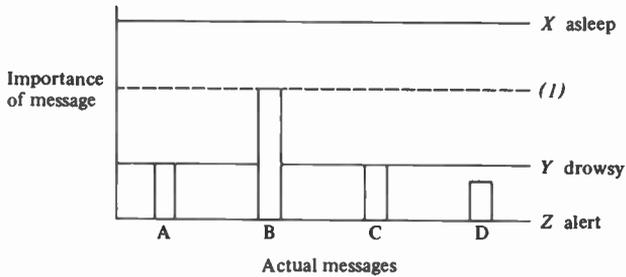
FIGURE 1. Diagram to illustrate operation of proposed system. (The inter-rupted horizontal line (1) represents the "level" of importance in the specific alerting system which is raised and lowered according to the incoming mes-sages. The solid horizontal lines represent levels of general arousal. At X, the organism is asleep, and none of the actual messages produce alerting. At Y, the organism is drowsy, and only some incoming messages produce alerting. At X, the organism is awake. All messages could be alerted to, but the specific alerting system allows only b to be heeded.)

out is given by Deutsch's (1953, 1956, 1960) theory of learning and motivation, and will be only briefly summarized here, since it is not the main point of the paper. It is assumed that on exposure to a succession of stimuli, link-analyzer units responsive to these stimuli will be connected together. Certain primary links, when stimulated by physiological factors, generate excitation, and this is passed on from link to link along the connections established by experience. Each link-analyzer unit will receive excitation depending first, on the state of the pri-mary links to which it is connected, either directly or indirectly, and second, on the "resistance" of such a connection, which is determined by past learning. It is assumed that the amount of such excitation arriving at a link-analyzer unit deter-mines both its threshold of excitability by incoming stimuli (leading to an in-creased readiness to perceive a stimulus whether it is there or not) and the rank-ing of importance of such a stimulus (e.g., Lawrence, 1949, 1950). We should predict from this theory an inverse correlation between the attention-getting or distracting value of a stimulus when attention is being paid to another, and its threshold (regarded as the likelihood of its being reported by a subject when he is asked to say what he perceives). We should also expect that stimuli which have a high importance weighting should more often be mistakenly perceived when similar stimuli are present.

NEUROPHYSIOLOGICAL CORRELATES

We may ask how the suggested system would fit what is known of the physiologi-cal substrate of attentive behavior. One of the salient features of the system as

proposed is that it assumes that all sensory messages which impinge upon the or-
ganism are perceptually analyzed at the highest level. It would therefore be of rel-
evance to discuss the group of neurophysiological experiments, the results of
which have been claimed to demonstrate a neural blockage of "rejected" mes-
sages at the lower levels of the primary sensory pathways. Hernández-Péon,
Scherrer, and Jouvet (1956) showed that the evoked response at the dorsal coch-
lear nucleus to clicks was reduced by the presentation of "distracting" olfactory
and visual stimuli. A similar effect was found in the visual pathways (Hernán-
dez-Péon, Guzman-Flores, Alcarez and Fernandez-Guardiola, 1957). Stimulation
of the reticular formation could produce similar results, and it was supposed that
such stimulation was treated as the presentation of a distracting stimulus. It has
also been demonstrated by various workers (e.g., Galambos, Sheatz, and Vernier,
1956; Hernández-Péon and Scherrer, 1955) that responses to auditory clicks re-
corded from the dorsal cochlear nucleus (as well as other placements) diminish
with repetition. Habituation to photic stimuli has been demonstrated for the ret-
ina (Palestini, Davidovich, and Hernández-Péon, 1959) and for the olfactory
bulb (Hernández-Péon, Alcocer-Cuaron, Lavin, and Santibañez, 1957). It was
therefore proposed that during inattention to a signal (either by distraction or
habituation) information concerning this signal was blocked at the level of the
first sensory synapse by means of "afferent neuronal inhibition." Recently, how-
ever, evidence has been produced indicating, at least for the visual and auditory
pathways, that such changes in the evoked potential were due to peripheral fac-
tors, and represented simply a decrease in the effective intensity of the stimulus.
Hugelin, Dumont, and Paillas (1960) report that when the middle ear muscles
were cut stimulation of the reticular formation would not cause a diminution in
the amplitude of the evoked responses. They report further that such contractions
of the middle ear muscles which result from reticular stimulation produce a mean
diminution of microphonic potentials of less than 5 decibels. The reduction in
sensation brought about by these means therefore appears unimportant. Naquet,
Regis, Fischer-Williams, and Fernandez-Guardiola (1960) found that if the size
of the pupil were fixed by local application of atropin the evoked potential re-
corded from placements below the cortex demonstrated a consistent amplitude.

The above findings do not, however, apply to changes in the cortical evoked
response during distraction or habituation. Moushegian, Rupert, Marsh, and Gal-
ambos (1961) found that in animals in which the middle ear muscles had been
cut, cortical evoked responses to clicks still demonstrated diminution during ha-
bituation and distraction, and amplification when the clicks were associated with
puffs of air to the face. Naquet, in the experiment quoted above, reports that ap-
plication of atropin to the pupil did not prevent a variation in cortical evoked re-
sponses, which diminished during desynchronization and were enhanced during
synchronization of electrical rhythms, also changing in morphology.

Reports of changes in cortical evoked responses during habituation and dis-

traction are many and varied, and it would be impossible in this space to describe the field in detail. Certainly disagreement exists over what occurs as well as over its interpretation. For instance, Horn (1960), recording flash evoked responses in the visual cortex of cats when resting, and when watching a mouse, found that the responses were reduced in amplitude when the cat was watching the mouse; when it ignored the mouse, responses remained of high amplitude. Further, after a series of tone-shock combinations, it was noted that the evoked response to flash was reduced after a series of tones only if there was "some visual searching component in the cat's response to the acoustic stimuli." Horn argues that attenuation of evoked responses in the cortex might be correlated with *greater* sensitivity in the appropriate region, rather than signifying a reduction in incoming information. However, other recent experimenters continue to maintain that evoked responses diminish in amplitude when attention is *not* being paid to the test stimulus. Garcia-Ausst, Bogacz, and Vanzulli (1961), recorded scalp visual evoked responses in human subjects (who were able to give introspective reports) during presentation of flash stimuli. They report,

When the stimulus is significant and therefore attention is paid to it, the response is relatively simple and widespread. When, on the other hand, the stimulus is not significant and no great attention is paid to it, the response is reduced, complex, and localized.

It would seem that changes in the evoked potential at the cortex do indeed take place during habituation and attention shifts; but that what those changes exactly are, and what they represent, is not yet clear.

We should indeed expect, on the above theory of attention, changes in the cortical evoked potential when attention is being paid to a stimulus, reflecting the activation of various processes, such as motor output and memory storage. Pertinent to this assumption is the discovery by Hubel, Henson, Rupert, and Galambos (1959) of what they term "attention" units in the auditory cortex. By the use of microelectrodes implanted in unanesthetized and unrestrained cats, they obtained records from units which responded only when the animal was "paying attention" to the sound source. These attention units appeared to be both interspersed amongst the others and segregated from them. We may venture to interpret these results by supposing that the units in question formed part of the systems, discussed above, responsible for the appropriate motor response to stimulation or the committing of items to memory, and so forth, or that they lay on the pathway to these systems. Thus they would be inactive even if impulses evoked by auditory stimulation were reaching the cortex, provided that the animal was not also attending to the stimuli.

There is another theoretical assumption for which we might reasonably seek a neurophysiological counterpart. We suppose that a selection of inputs from a variety of sources takes place by comparison with a fluctuating standard. This implies the existence of an undifferentiated structure with widespread connec-

tions with the rest of the central nervous system. We are tempted, on account of the evidence for the diffuseness of its input, to identify the brain stem reticular formation as this particular structure. Potentials may be evoked throughout this structure by excitation of various sensory systems (French, Amerongen, and Magoun, 1952; Starzl, Taylor, and Magoun, 1951), and various cortical structures (Bremer and Terzuolo, 1954; French, Hernández-Péon, and Livingston, 1955). Occlusive and facilitatory interaction between responses evoked in the reticular formation from very different sources have further been observed (Bremer and Terzuolo, 1952, 1954; French *et al.*, 1955). Single unit studies demonstrating a convergence of input from several sources have also been reported (Amassian, 1952; Amassian and De Vito, 1954; Hernández-Péon and Hagbarth, 1955; Scheibel, Scheibel, Mollica, and Moruzzi, 1955). A similar conclusion, that the reticular formation is capable of acting as a nonspecific system, can be based on neuro-anatomical evidence. Scheibel and Scheibel (1958) state on the basis of their extensive histological study:

. . . the degree of overlap of the collateral afferent plexuses is so great that it is difficult to see how any specificity of input can be maintained, rather it seems to integrate and vector a number of inputs.

We have also postulated that the fluctuating level correlates with states of arousal. Again the brain stem reticular formation seems well suited to fulfill this function. Its importance in the regulation of states of arousal has been demonstrated both through work involving lesions (Bremer, 1935; French, 1952; French and Magoun, 1952; Lindsley, Schreiner, Knowles, and Magoun, 1949) and stimulation of this structure (Moruzzi and Magoun, 1949; Segundo, Arana, and French, 1955). Recently Moruzzi (1960) has shown that the lower brain stem may play an important role in the initiation of sleep. It also seems likely that the thalamic reticular system is involved in the regulation of states of arousal. Large bilateral lesions of the anterior portion of this system may produce coma analogous to that produced by lesions of the mid-brain (French *et al.*, 1952) although the depth of coma so produced is less profound. Stimulation of portions of this system has also been shown to produce either sleep or arousal depending on the parameters of stimulation (Akimoto, Yamaguchi, Okabe, Nakagawa, Nakamura, Abe, Torii, and Masahashi, 1956; Hess, 1954).

The work of Adametz (1959), Chow and Randell (1960), and Doty, Beck, and Kooi (1959), who demonstrated that with different operational techniques and with assiduous nursing care massive lesions of the mid-brain-reticular formation need not produce coma, should, however, be considered. Chow, Dement, and Mitchell (1959) found also that massive lesions in the thalamic reticular system need not produce coma. Until reasons for these discrepant results are found we must regard our conclusions as to the role of the reticular system in attention as tentative.

Whatever the explanation of the findings on lesions in the reticular formation may turn out to be, it seems that, if we are right, some diffuse and nonspecific system is necessary as a part of the mechanism subserving selective attention. Such a system should be found to have afferent connections from all discriminatory and perceptual systems. Through these connections it should be influenced to take up a variety of levels; the level at any one time corresponding with the level of the "highest" afferent message from the discriminatory mechanisms. On its efferent side such a nonspecific system should again be connected with all discriminatory and perceptual mechanisms. Through such connections it would signal to them its own level. If this level of the nonspecific system was above that of a particular discriminatory mechanism, no registration in memory or motor adjustment would take place, if such a discriminatory mechanism was stimulated. Consequently, only that discriminatory mechanism being activated whose level was equal to that of the diffuse system would not be affected. In this way the most important message to the organism will have been selected.

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THE HUMAN
RECEIVING SYSTEM

E. H. Adrian

You hear someone speaking because his voice produces very rapid oscillations of air pressure close to your ears. The oscillations are generated in the current of air from his lungs as it passes over his vocal cords, and their frequency varies between 50 and 10,000 a second. If you are near enough, the pressure changes reach your ears by direct transmission through the air; at greater distances they may be transmitted by an electrical system with a microphone at his end and a loud-speaker at yours.

The changes of air pressure in the neighborhood of your ears are very small. But, if you are to hear them, they must be great enough to make a slight vibration in your eardrums, the delicate membrane at the end of the tube which goes in from the external ear. The drum is linked mechanically to the much smaller "basilar membrane" in the inner ear, immersed in fluid and covered with nerve cells which are connected with the brain. So you hear a sound because the

oscillations make your basilar membranes vibrate and the nerve cells on them signal the movement to your brain.

You see an object because your eyes have lenses which focus its image on the sheet of nerve cells at the back of the eyeball, the retina. The cells there signal the pattern of light and shade to the brain, as the cells of the basilar membrane signal the pattern of sound.

The eye and the ear are the two sense organs which deal with nearly all the information telling us what is happening in the world outside. The nose sometimes helps, and there are sensitive structures all over the body to give information about touch, pressure and pain, and temperature. Many other "senses" are needed to make the body work effectively as an organized whole. Signals from all of them must be sent up to the headquarters of the nervous system, the brain, and they must reach it with a minimum of delay.

The science of communication has to deal with the physical transmission of information over thousands of miles, but if the information is to end up in the human brain, there is always this final biological step to consider—the transmission between the sense organ on the surface of the body and the brain inside the head.

The transmitting elements are the nerve fibers. The nerve cells are a special variety with long or short filaments running out from the cell body, and there is usually one which is much longer than the rest. This is the nerve fiber. In man a fiber may run the whole five feet from the toes to the head. It is only a few thousandths of a millimeter in diameter, but it is protected by a sheath of fatty material, and as a rule many fibers run side by side to form a nerve trunk. One of the large nerves in the arm or leg may contain many thousands of them, and the optic nerves have a million or more. They are used for sending in all the information from the sense organs to the brain and for sending out all the signals to the muscles.

Every kind of rapid communication in the body depends on these long threads of living matter which stretch out from the nerve cells, but the signals they transmit are all in the same form. There is, in fact, only one kind of disturbance that can be made to travel rapidly along a nerve fiber—a momentary surface change which we call the nerve impulse. In some fibers it can travel as fast as 100 meters a second, persisting no longer than a thousandth of a second at any point. A series of these impulses can be sent down the fiber at very short intervals, but it is not possible for the fiber to transmit impulses of different kinds.

The nerve impulse, then, is the basis of communication within the body. It is a momentary disturbance which moves along a minute thread of living matter, but fortunately we can follow its movement because it produces a small charge of electrical potential. By recording this, we can reach a fairly clear picture of the impulse as a biophysical event. It depends on a sudden change at some point on the surface membrane of the fiber which makes it more permeable and allows a

movement of ions in and out. This is soon brought to an end, but the forces set up induce a similar change in the neighboring surface with a similar movement of ions, and in this way the surface change travels from one end of the fiber to the other. The sequence of events has been studied in detail by taking advantage of the remarkable variety of structure in the animal kingdom. The nerve fibers of vertebrates are too slender to stand much manipulation, but the squid and the cuttlefish have a few very large nerve fibers to carry out the most rapid signaling—tubular structures with a diameter of as much as one millimeter. In these giant fibers electrodes and pipettes can be placed inside as well as outside the fiber without interfering with its power to conduct impulses. In this way Hodgkin and his colleagues have been able to show that, when the surface change takes place, there is first a movement of sodium ions into the fiber and then of potassium ions out of it. The movement takes place because the resting fiber always maintains a lower concentration of sodium and a higher of potassium inside than outside. It is these differences in concentration which provide the store of available energy needed in the transmission process, and they are re-established as soon as the impulse has passed. But very little energy is involved and it is not yet certain how the recharging is done. In fact, we are still very far from a complete picture on a molecular scale of all that is taking place in the nerve fiber. In spite of that, we have a reasonably clear picture of the traveling disturbance, the basis for all nervous signaling.

The picture applies to nerve fibers of every kind, though the active region does not travel at the same speed in all. The speed depends on the temperature as well as on the dimensions and structure of the fiber. In mammals, which have a constant temperature, the velocity of the impulse in the smallest nerve fibers may be less than one meter a second, but in some of the larger it reaches 100 meters. Thus, in man an impulse set up in the finger tip can reach the brain in one hundredth of a second.

However rapidly it may have traveled, the arrival of a single impulse in a sensory nerve fiber can only show that the ending has been stimulated. It cannot show what has stimulated it or whether the stimulus was weak or strong, for the impulses themselves cannot be made to vary; each is the same brief surface change. But the signals in each fiber are nearly always made up of a group of impulses, and this can convey much more information, because both the number in the group and the intervals between them can be varied.

There must always be a short interval, a pause for recovery between one impulse and the next. At the sensitive ending, however, a mechanical or chemical stimulus will set up repeated impulses as long as it remains effective, and the interval between them will depend on its intensity. At the receiving end, therefore, the spacing of the impulses will show whether the stimulus is strong or weak. It will also show how it fluctuates from moment to moment, for the intervals we are concerned with are all very short: the frequency of a train of impulses may be as

high as 500 a second. Thus a sequence lasting less than a second will be quite capable of indicating rapid changes in the intensity of the stimulus.

The nature of the stimulus cannot be indicated in the message, but it can be inferred from the particular nerve fibers which carry it. The fibers from the different kinds of sense organs run a different course in the central nervous system, and so messages arriving in the optic nerve fibers indicate light and darkness, and those in the auditory nerve indicate sound. Messages in the skin nerves have to indicate touch, temperature, or pain, but the fibers for each kind of sensation are of different size and have different central connections. In fact, all our detailed information about sights and sounds and contacts with the body must always depend on the arrangement of the nerve fibers as independent pathways leading to corresponding parts of the brain. A complex pattern of light and shade on the retina produces a corresponding pattern of activity in the sensitive elements, and so in the nerve cells of the brain; a complex sound is analyzed into its component frequencies by the basilar membrane of the ear, and each component is signaled by different groups of nerve fibers, so that the pattern which reaches the brain corresponds to that set up in the vibrating membrane. And, of course, the number of nerve fibers in action will show whether the stimulus is restricted or widespread. Touching the skin with a hair will give impulses in a few fibers, pressure over a large area will give them in a large number.

It is not difficult to show that these signals from our various sense organs do arrive in different parts of the human brain, for the activity they set up in it gives rise to changes of electrical potential in the brain surface. These can be recorded in detail if the brain surface is exposed, but they can be detected in normal conditions by electrodes fastened to the scalp. The signals from the eye arrive in the occipital lobe of the brain, so the electrical disturbance is limited to the occipital region when a flash of light reaches the eye. Signals from the skin arrive in the parietal lobe; a stimulus to the skin produces an electrical disturbance limited to the scalp over the parietal region.

Up to this point the story is fairly clear. Information from the sense organs is communicated to the central nervous system by trains of impulses in the nerve fibers; the spacing of the impulses in each fiber shows the intensity of the stimulus from moment to moment; and its nature can be inferred from the particular connections of the nerve fiber—whether it leads from the ear, the eye, or the skin, etc. In theory, at least, if we could record all the impulse messages entering the central nervous system in a given period and identify the nerve fiber conveying each of them, we ought to be able to extract all the information which reaches the brain from the outside world.

Beyond that the story is much less clear. The information enters the central nervous system, which is no more than an elaborate organization of nerve cells and connecting fibers. It is a very delicate structure, protected from injury by being enclosed in bone and cushioned by fluid. The brain in man is by far the

largest and most important part of the nervous system, for it is the part which is specially related to intelligent behavior and to mental activity and consciousness.

The brain is concerned with general policy, with directing activity in accordance with the external situation as signaled by the sense organs, and with the past experience of the individual, as stored up in memory traces, habits or conditioned reflexes. But the administrative details are managed by the spinal cord and brain stem. This is the more primitive part of the central nervous system, well developed in all vertebrates. It is the route by which information reaches the cerebrum and by which all the executive signals to the muscles are sent out.

Much of our knowledge of what goes on in the brain has been based on the analysis by Sir Charles Sherrington of what goes on in the spinal cord and brain stem, for these parts contain most of the nervous organization which makes it possible for an animal to move as a whole, to balance its body in the standing position, to walk or run, and to carry out movements in response to sensory stimulation. Elaborate activities of this kind can go on without the brain, and the movements are smoothly executed because there are many sense organs in muscles and joints to supply the brain stem and cord with a continuous picture of tensions and pressure in the limbs. Whenever a muscle contracts, there is a sensory feedback by trains of impulses focused on the nerve cells which are directing the movement. There are many cross-connections and many kinds of nerve cells to be reckoned with, and at the back of all problems of how the nervous system works there is the problem of how it came to be built. But if we take the structural organization for granted, there should be no difficulty in understanding how this part of the central nervous system co-ordinates all our postures and movements.

Understanding what goes on in the brain is much more difficult, because we are dealing now with the headquarters of the nervous system. The reports from the outside world are analyzed there, and the appropriate course of action is decided. The receipt of messages from the sense organs by the brain not only decides our behavior; it affects our thinking as well. Diagrams of impulses playing upon an elaborate organization of nerve cells may be all we need to account for the skilled movements we can make, but our conscious activity seems to be in a different category altogether. Perhaps there is no real difficulty in this; at all events, we have not yet reached the stage where the physiologist has to be concerned with it. We can at least be sure that our conscious picture of the world is very closely related to the stream of information which reaches the brain from the sense organs, and we can think of both together as the product of the impulse messages in the sensory nerve fibers.

But a diagram of the sense organs with pathways leading to different regions of the brain surface gives a misleading impression of the way in which our information is collected. It seems to imply that the sense organs are left to themselves to signal the particular events which happen to excite them. In fact, they

need constant adjustment by the central nervous system if they are to work effectively, and the adjustment often involves activity in other parts of the body. For instance, the eyes have diaphragms which are opened or closed to admit the amount of light most suitable for the retina, and both eyes are directed to the same point by the external ocular muscles. The eardrum has a small muscle to adjust its tension to suit the noise. To smell, we regulate the air current through the nose by sniffing if the odor is faint and holding our breath if it is too strong.

Adjustments of this kind are made automatically by nerve cells controlled by the discharge from the sense organ, but in addition we make active use of our sense organs to explore our surroundings. The eyes and the head are both turned to bring fresh areas into the field of vision; we finger an object to discover its texture; in fact, we are constantly focusing our sense organs on objects which have aroused our interest.

That brings us to one of the principal factors determining cerebral activity, the factor described as attention. Many different streams of information come into the brain and reach the level of consciousness, and the impulses which the brain sends out to the muscles may keep several kinds of skilled movement in progress at the same time. When we drive a car, for instance, we can watch the road as we listen to what our passenger is saying, and we can answer him as we keep the car on its course. The brain is a very large organization of nerve cells; networks of connecting filaments spread out into a thick layer over the cerebral hemisphere. There should be room enough in it for several independent streams of activity. But it does not take much introspection to realize that at certain times a particular kind of information or a particular line of action may have complete priority. The sight of a car on the wrong side of a crowded road may make us deaf to what our passenger is saying. All our attention is then given to what we are seeing and to the movements we must make to escape an accident.

This kind of selective process is most in evidence in emergencies, but it operates continuously, either by making us quite unaware of events which are signaled to the brain or by suppressing the further process of recalling their associations. Thus, I can see an audience, but as long as I am occupied with giving a lecture I cannot attend to the details of the visual scene or recognize a familiar face. This selective process comes in at the cerebral level and does not apply to the reactions carried out by the brain stem and spinal cord: my preoccupation with my talk has no influence at this level and does not affect the adjustments which keep my balance and co-ordinate my breathing movements as I speak. In fact, as long as I stay awake, my spinal cord and brain stem will continue their automatic control of posture and movement: the signals which are sent out to the muscles will always be adjusted by the inflow of impulses which signal the pressures and tensions.

At the cerebral level, the signals which claim attention are of two kinds: the sudden interruption and the message which brings exciting news. A flash of light

or a loud bang, anything unexpected, can distract us, for the moment at least, whatever its nature. But more lasting effects are produced by the complex messages which arouse association with a strong emotional coloring—fear or anger or pleasure. We are still a long way from understanding how memories are stored in the brain and how an incoming message excites our memory system. Clearly it must contain elements which fit somehow into the pattern laid down by a past experience, but until we know more about the biophysical processes involved in learning and memory, we cannot tell what sort of patterns they are. And until we know more about the forces which direct our behavior, we can say little about the way in which they are related to emotional experiences.

We have some evidence to show how the general level of activity in the brain can be influenced by sensory messages. In the upper part of the brain stem there is a mass of cells and cross-connections known as the "reticular formation." If this is stimulated, either directly by an electric current or by the arrival of trains of impulses from the sense organs, there is an immediate change in the activity of the cerebral hemispheres, shown both by the electrical oscillations which can be detected at the brain surface and by the general behavior of the animal. If there is little to activate the reticular formation, the cerebrum soon lapses into the condition it is in when the animal is falling asleep. There are large electrical oscillations from most of the brain surface with a regular rhythm of ten a second or less, or still larger waves at longer intervals. Stimulating the reticular formation brings an immediate change. The regular oscillations are replaced by much smaller electrical oscillations, occurring irregularly at higher frequencies, and the animal becomes awake and alert. In man the closing and opening of the eyes usually causes a change of the same kind in the electrical activity of the brain; we can remain reasonably alert with our eyes closed, but closing them cuts off the most important source of information to the brain, and in most of us this makes the electrical activity change from the smaller irregular oscillations of potential to the regular ten-a-second rhythm. When we are really fast asleep, this rhythm goes, too, for it seems to represent the state in which most of the cerebral hemispheres are unoccupied but are ready to take part in some line of intelligent activity if the need for it arises. The electrical oscillations at the surface of the brain are much easier to record than to interpret. There are other lines of evidence about the change from sleep to waking, however, and they support the idea that it is controlled by the central regions at the base of the brain, including the reticular formation. Any marked increase in the flow of impulses from the sense organs seems to act there, and its effect is to cause a general increase in the activity of the brain and in its ability to interpret the information it receives. The alarm clock or the shaft of sunlight through the curtains wakes us up because the sudden increase in the sensory input turns up the volume control. The whole cerebral system is made more active, and so we become conscious and aware enough of our surroundings to remember where we are.

This does not help us to understand how our attention comes to be concen-

trated in particular fields when we are wide awake. What makes a message arouse and fix our interest? It may help us to think of the memory system of the brain as a vast number of files of different importance and accessibility. Those relating to all the skilled habits we have learned are seldom referred to, because they have been incorporated in the daily routine of our life. Others may be concerned with trivial events; others, marked "personal and confidential," can be examined only at subconscious levels or with the aid of a psychoanalyst. But the signals which contain the key to important files will open them wide enough to cause a stirring in that part of the memory system, whether it reaches consciousness or not. We suppose, perhaps on rather slender evidence, that this increased activity is signaled back to the central controlling regions, and that they react to it by opening up the channels for this particular line of information. Most of the cerebral apparatus will then be brought to bear on it, and information about other events will be neglected or suppressed.

We need not suppose that this will apply only to signals which arrive from the sense organs. A good deal of irregular activity goes on in the cells of the brain. From time to time the random pattern may well contain some elements which arouse interest and start a new train of thought. And we need not look far to explain why, after we have attended to one line of information or one train of thought for some time, we begin to lose interest in it and are more likely to let our attention be caught by something else. There is quite enough evidence on the physiological side to show that living cells in general, and particularly those of the central nervous system, become adapted sooner or later to disturbing forces and cease to react to them as they did initially. The basic truth is that expressed by W. S. Gilbert in *Trial by Jury:*

> You cannot eat breakfast all day,
> Nor is it the act of a sinner,
> When breakfast is taken away,
> To turn your attention to dinner.

But the function of the central nervous system is to receive and classify an immense amount of information from various sense organs and to arrive at a general line of policy for the individual—a policy for the future as well as for the immediate present. It is the supreme integrative organ, and we cannot expect to learn much about the detailed operation of particular parts by studying the smooth performance of the whole. So let us turn our attention again to the sense organs, particularly to the one which we rely on for most of our information— that is, the eye. By recording the flow of impulses in the optic nerve fibers, we are beginning to learn a good deal about the way in which information in general is passed on, for the retina is really far more than a mosaic of light-sensitive end-organs connected to the brain by the optic nerve; in fact, it is itself an outlying part of the central nervous system.

The retinal sheet is like the cerebral cortex, in that it has several layers of

nerve cells with connections laterally as well as in depth. The impulses it sends to
the brain have started not from the end-organs, the rods and cones in the sensi-
tive surface of the retina, but from the deepest layer of nerve cells in it. Many
end-organs may be in connection with each of these cells, and the information
which is handed on by them is not a total record of the illumination of the end-
organ at each moment: it has already been condensed and edited on its way
through the retinal layers.

   With other kinds of end-organ, the same kind of editing may well occur at
various levels below the cerebral hemisphere. It is editing of a journalistic kind,
since it emphasizes the latest news and presents a picture of it with all the con-
trasts exaggerated. One of the ways in which this is done is peculiar to the eye. It
has been found that, when we try to see clearly, our eyeballs are not focused
steadily on the object: very small jerking movements go on constantly, so that
the image on the retina is always shifting to and fro slightly in relation to the
sensitive elements which it covers. If this slight shifting of the image is pre-
vented, it is very soon impossible to see any of the details in it.

   The simplest way of stopping the movement would be to fix the eyeball. A
more convenient one, used by Professor Ditchburn, is to fasten a delicate optical
system to the front of the eyeball so that, in spite of its movement, the image is
always focused on the same place on the retina. It is not difficult to understand
why this prevents us from seeing the details. If we look at a small black patch on
a white field, a light to-and-fro movement of the image on the retina will insure
that the sensitive elements near the boundary will be repeatedly moving from
light to dark and back again. A fresh stimulation is always more effective than
one which has been in action for some time. Therefore the regions at the edge of
the patch send in repeated signals at high intensity. In this way, as long as the
to-and-fro movement of the image can go on its contour is repeatedly empha-
sized. If the image is always kept to the same place, there is no special signaling
to show its outline and we soon cease to be aware of it.

   There are other ways in which the nervous system of the retina can empha-
size particular features in the visual pattern. Contrasts are heightened because re-
gions which are more strongly stimulated inhibit the activity of regions nearby.
And there is at least the possibility that certain shapes or certain patterns of
movement may be given special prominence in the messages to the brain, owing
to the shape and size of the retinal fields which lead to each optic nerve fiber. In
fact, the more we explore the discharges in the optic nerve, the more evidence we
find of an editing in the retina brought about by the particular arrangement of
the nervous pathways in it and by the interactions known to take place between
one nerve cell and another.

   The slight unsteadiness of the eyeball can be an aid to distinct vision, be-
cause it emphasizes the outlines of the visual pattern. With other sense organs,
the outlines are less important, but if we search for a railway ticket in our

pocket, we must move the tactile surface of the fingers over all the other objects there until the familiar signals are aroused. The signals will come from muscles and joints as well as from the finger tips, and the different messages must be brought together at some level in the central nervous system. But the pattern which indicates the oblong cardboard will depend on a particular timing of the messages from the different sense organs as well as on their intensity.

The timing is, of course, important in appreciating visual information. With the ear, it is still more important. The different frequencies in a sound excite different parts of the sheet of end-organs in the inner ear, so that impulses in a particular group of nerve fibers signal a particular tone. But a tune or a voice is recognized by the way in which the tone pattern changes from moment to moment, and it is the sequence rather than the exact pitch that is important. In fact, with sound and sight, and probably with smell too, it is the arrangement of the pattern and the way it changes which stirs up our store of memories. The particular groups of nerve fibers which transmit the signals show the exact position of the image on the retina, but it is the shape of the image, rather than its size and exact position, which makes us recognize a letter of the alphabet or a face.

This brings us finally to the headquarters of our internal communication system. What arrives in consciousness is the outcome of a vast number of units which transmit independent signals but have many opportunities of influencing one another in the central nervous system. We can analyze the signaling by recording the impulses sent by each unit, but we must never think of them as active in isolation. Any change in the flow of impulses into or out of the central nervous system will cause readjustments in every part. There are countless internal feedback circuits besides those which co-ordinate our movements. At every level we must think of a constantly shifting activity adjusted to keep the whole organism running smoothly and engaged in the line of conduct which suits the circumstances.

This line, our general policy, is decided at the highest level of all, that of the cerebrum. There the pattern of activity is shaped by the incoming signals, suitably edited, reacting with the store of past experience laid down in the brain. We do not know exactly where or how it is laid down, but we are all aware that it plays an important part in directing our attention and our behavior. Many of the signals from the sense organs can reach the level of consciousness and cause a brief adjustment of our activity, but those that interest us and direct our thoughts have been reinforced by the habits and images formed by past experience. This gives the impulse message its full meaning and fits it into our mental picture of the outside world.

PART IV
COMMUNICATION THEORY: INTERACTION

A given system of behavior may be regarded as "communicative behavior" whenever the event in question exhibits some form of *interaction* between messages and individuals. The notion of interaction entails the idea of interdependence, a process having mutuality, shared activity, some form of linkage or connection with a message. In recent years a number of research investigations have examined the process whereby messages interact with communicators in producing given behavioral outcomes. Potentially, of course, virtually any communication variable may be instrumental in producing interaction. Nevertheless, most social communication involves the influence of the "common denominators" discussed in this section: tendencies toward cognitive consistency, credibility, personality attitudinal states, processes of influence, and message variables.

The pattern of much human interaction reflects the tendency of man to behave in ways that minimize the internal inconsistencies among his beliefs, feelings, actions, and interpersonal relations. In "The Concepts of Balance, Congruity, and Dissonance," Robert Zajonc explains the essential features of three theories of cognitive consistency.

Human interaction is typically a function of credibility or ethos of the communicator. "A Summary of Experimental Research in Ethos" by Kenneth Andersen and Theodore Clevenger, Jr., reviews research findings which specify how perceptions of a source by a receiver influence the response to a message.

Another major determinant of human interaction is the personality make-up of those engaged in communication. In "An Overview of Persuasibility Research," Irving Janis and Carl Hovland demonstrate how personality factors influence one's response to varying forms of social influence. Also discussed in the essay are the importance of *predispositional factors* in personality—those accounting for individual differences in the observed effects of com-

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munication when all communication stimuli are held constant.

Another important factor in human interaction is the attitudinal stand of the receiver of messages. Attitudes may be generally defined as predispositional responses, the internal "feelings" and cognitions which supposedly govern overt action. But messages may elicit disparate responses for individuals who take similar attitudinal stands on a topic. In "The Functional Approach to the Study of Attitudes" Daniel Katz suggests that the explanation for varying responses to messages may lie with the particular functions which attitudes have for those who hold them.

Most people appear to change their minds readily on topics that are of no vital concern to them; but on issues which are highly relevant or ego-involving they seem to be far more resistant to change. Thus some attitudes are highly ego-involving, while others are not. The operation of ego-involvement in processes of social judgment and its importance in determining responses to messages are the objects of the essay by Roger Nebergall on "The Social Judgment-Involvement Approach to Attitude and Attitude Change."

The type of influence process which is used in any given human interaction is yet another crucial factor determining behavioral outcome. Herbert Kelman, in his essay on the "Processes of Opinion Change," formulates a theoretical explanation for given forms of social influence based upon the concepts of compliance, identification, and internalization.

The last factor to be examined as a determinant of interaction concerns the nature of the message itself. Arthur Cohen, in his essay on "The Communication," summarizes research findings which demonstrate how effectiveness or ineffectiveness of various patterns of organization influences the interaction and response of receivers to messages.

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THE CONCEPTS
OF BALANCE, CONGRUITY,
AND DISSONANCE

Robert B. Zajonc

Common to the concepts of balance, congruity, and dissonance is the notion that thoughts, beliefs, attitudes, and behavior tend to organize themselves in meaningful and sensible ways.[1] Members of the White Citizens Council do not ordinarily contribute to NAACP. Adherents of the New Deal seldom support Republican candidates. Christian Scientists do not enroll in medical schools. And people who live in glass houses apparently do not throw stones. In this respect the concept of consistency underscores and presumes human *rationality*. It holds that behavior and attitudes are not only consistent to the objective observer, but that individuals try to appear consistent to themselves. It assumes that inconsistency is a nox-

[1] The concepts of balance, congruity, and dissonance are due to Heider, Osgood and Tannenbaum, and Festinger, respectively. (F. Heider, "Attitudes and Cognitive Organization," *Journal of Psychology*, Vol. 21, 1946, pp. 107–112. C. E. Osgood and P. H. Tannenbaum, "The Principle of Congruity in the Prediction of Attitude Change," *Psychological Review*, Vol. 62, 1955, pp. 42–55. L. Festinger, *A Theory of Cognitive Dissonance*, Evanston, Ill., Row, Peterson, 1957.) For purposes of simplicity we will subsume these concepts under the label of consistency.

ious state setting up pressures to eliminate it or reduce it. But in the *ways* that consistency in human behavior and attitudes is achieved we see rather often a striking lack of rationality. A heavy smoker cannot readily accept evidence relating cancer to smoking; [2] a socialist, told that Hoover's endorsement of certain political slogans agreed perfectly with his own, calls him a "typical hypocrite and a liar." [3] Allport illustrates this irrationality in the following conversation:

MR. X: The trouble with Jews is that they only take care of their own group.

MR. Y: But the record of the Community Chest shows that they give more generously than non-Jews.

MR. X: That shows that they are always trying to buy favor and intrude in Christian affairs. They think of nothing but money; that is why there are so many Jewish bankers.

MR. Y: But a recent study shows that the per cent of Jews in banking is proportionally much smaller than the per cent of non-Jews.

MR. X: That's just it. They don't go in for respectable business. They would rather run night clubs.[4]

Thus, while the concept of consistency acknowledges man's rationality, observation of the means of its achievement simultaneously unveils his irrationality. The psychoanalytic notion of rationalization is a literal example of a concept which assumes both rationality and irrationality—it holds, namely, that man strives to understand and justify painful experiences and to make them sensible and rational, but he employs completely irrational methods to achieve this end.

The concepts of consistency are not novel. Nor are they indigenous to the study of attitudes, behavior, or personality. These concepts have appeared in various forms in almost all sciences. It has been argued by some that it is the existence of consistencies in the universe that made science possible, and by others that consistencies in the universe are a proof of divine power.[5] There is, of course, a question of whether consistencies are "real" or mere products of ingenious abstraction and conceptualization. For it would be entirely possible to categorize natural phenomena in such a haphazard way that instead of order, unity, and consistency, one would see a picture of utter chaos. If we were to eliminate one of the spatial dimensions from the conception of the physical world, the consistencies we now know and the consistencies which allow us to make reliable predictions would be vastly depleted.

The concept of consistency in man is, then, a special case of the concept of universal consistency. The fascination with this concept led some psychologists to rather extreme positions. Franke, for instance, wrote, ". . . the unity of a person

[2] Festinger, *op. cit.*, pp. 153–156.

[3] H. B. Lewis, "Studies in the Principles of Judgments and Attitudes: IV. The Operation of 'Prestige Suggestion'," *Journal of Social Psychology*, Vol. 14, 1941, pp. 229–256.

[4] G. W. Allport, *The Nature of Prejudice*, Cambridge, Mass., Addison-Wesley, 1954.

[5] W. P. Montague, *Belief Unbound*, New Haven, Conn., Yale University Press, 1930, pp. 70–73.

can be traced in each instant of his life. There is nothing in character that con-
tradicts itself. If a person who is known to us seems to be incongruous with him-
self that is only an indication of the inadequacy and superficiality of our pre-
vious observations." [6] This sort of hypothesis is, of course, incapable of either
verification or disproof and therefore has no significant consequences.

Empirical investigations employing the concepts of consistency have been
carried out for many years. Not until recently, however, has there been a pro-
grammatic and systematic effort to explore with precision and detail their partic-
ular consequences for behavior and attitudes. The greatest impetus to the study
of attitudinal consistency was given recently by Festinger and his students. In ad-
dition to those already named, other related contributions in this area are those
of Newcomb, who introduced the concept of "strain toward symmetry," [7] and of
Cartwright and Harary, who expressed the notions of balance and symmetry in a
mathematical form.[8] These notions all assume inconsistency to be a painful or at
least psychologically uncomfortable state, but they differ in the generality of ap-
plication. The most restrictive and specific is the principle of congruity, since it
restricts itself to the problems of the effects of information about objects and
events on the attitudes toward the source of information. The most general is the
notion of cognitive dissonance, since it considers consistency among any cogni-
tions. In between are the notions of balance and symmetry, which consider atti-
tudes toward people and objects in relation to one another, either within one per-
son's cognitive structure, as in the case of Heider's theory of balance, or among a
given group of individuals, as in the case of Newcomb's strain toward symmetry.
It is the purpose of this paper to survey these concepts and to consider their im-
plications for theory and research on attitudes.

THE CONCEPTS OF BALANCE
AND STRAIN TOWARD SYMMETRY

The earliest formalization of consistency is attributed to Heider,[9] who was con-
cerned with the way relations among persons involving some impersonal entity
are cognitively experienced by the individual. The consistencies in which Heider
was interested were those to be found in the ways people view their relations
with other people and with the environment. The analysis was limited to two per-

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[6] R. Franke, "Gang und Character," *Beihefte, Zeitschrift für angewandte Psychologie*,
No. 58, 1931, p. 45.
[7] T. M. Newcomb, "An Approach to the Study of Communicative Acts," *Psychological
Review*, Vol. 60, 1953, pp. 393–404.
[8] D. Cartwright and F. Harary, "Structural Balance: A Generalization of Heider's
Theory," *Psychological Review*, Vol. 63, 1956, pp. 277–293.
[9] Heider, *op. cit.*

Balanced states   Unbalanced states
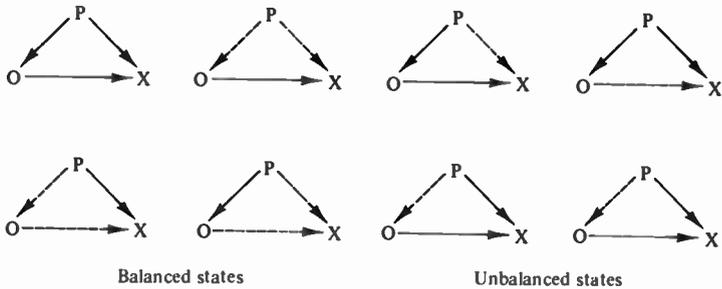
FIGURE 1. Examples of balanced and unbalanced states according to Heider's definition of balance. Solid lines represent positive, and broken lines negative, relations.

sons, labeled P and O, with P as the focus of the analysis and with O representing some other person, and to one impersonal entity, which could be a physical object, an idea, an event, or the like, labeled X. The object of Heider's inquiry was to discover how relations among P, O, and X are organized in P's cognitive structure, and whether there exist recurrent and systematic tendencies in the way these relations are experienced. Two types of relation, liking (L) and so-called U, or unit, relations (such as possession, cause, similarity, and the like) were distinguished. On the basis of incidental observations and intuitive judgment, probably, Heider proposed that the person's (P's) cognitive structure representing relations among P, O, and X are either what he termed "balanced" or "unbalanced." In particular, he proposed, "In the case of three entities, a balanced state exists if all three relations are positive in all respects or if two are negative and one positive." Thus a balanced state is obtained when, for instance, P likes O, P likes X, and O likes X; or when P likes O, P dislikes X, and O dislikes X; or when P dislikes O, P likes X, and O dislikes X (see Figure 1). It should be noted that within Heider's conception a relation may be either positive or negative; degrees of liking cannot be represented. The fundamental assumption of balance theory is that an unbalanced state produces tension and generates forces to restore balance. This hypothesis was tested by Jordan.[10] He presented subjects with hypothetical situations involving two persons and an impersonal entity to rate for "pleasantness." Half the situations were by Heider's definition balanced and half unbalanced. Jordan's data showed somewhat higher unpleasantness ratings for the unbalanced than the balanced situations.

    Cartwright and Harary [11] have cast Heider's formulation in graph-theoretical terms and derived some interesting consequences beyond those stated by Heider. Heider's concept allows either a balanced or an unbalanced state. Cart-

[10] N. Jordan, "Behavioral Forces That Are a Function of Attitudes and of Cognitive Organization," *Human Relations*, Vol. 6, 1953, pp. 273–287.

[11] Cartwright and Harary, *op. cit.*

wright and Harary have constructed a more general definition of balance, with balance treated as a matter of degree, ranging from 0 to 1. Furthermore, their formulation of balance theory extended the notion to any number of entities, and a experiment by Morrissette [12] similar in design to that of Jordan obtained evidence for Cartwright and Harary's derivations.

A notion very similar to balance was advanced by Newcomb in 1953.[13] In addition to substituting A for P, and B for O, Newcomb took Heider's notion of balance out of one person's head and applied it to communication among people. Newcomb postulates a "strain toward symmetry" which leads to a communality of attitudes of two people (A and B) oriented toward an object (X). The strain toward symmetry influences communication between A and B so as to bring their attitudes toward X into congruence. Newcomb cites a study in which a questionnaire was administered to college students in 1951 following the dismissal of General MacArthur by President Truman. Data were obtained on students' attitudes toward Truman's decision and their perception of the attitudes of their closest friends. Of the pro-Truman subjects 48 said that their closest friends favored Truman and none that their closest friends were opposed to his decision. Of the anti-Truman subjects only 2 said that their friends were generally pro-Truman and 34 that they were anti-Truman. In a longitudinal study, considerably more convincing evidence was obtained in support of the strain-toward-symmetry hypothesis. In 1954 Newcomb set up a house at the University of Michigan which offered free rent for one semester for seventeen students who would serve as subjects. The residents of the house were observed, questioned, and rated for four to five hours a week during the entire semester. The study was then repeated with another set of seventeen students. The findings revealed a tendency for those who were attracted to one another to agree on many matters, including the way they perceived their own selves and their ideal selves, and their attractions for other group members. Moreover, in line with the prediction, these similarities, real as well as perceived, seemed to increase over time.[14]

Newcomb also cites the work of Festinger and his associates on social communication [15] in support of his hypothesis. Festinger's studies on communication have clearly shown that the tendency to influence other group members toward one's own opinion increases with the degree of attraction. More recently Burdick and Burnes reported two experiments in which measures of skin resistance (GSR) were obtained as an index of emotional reaction in the presence of

[12] J. Morrissette, "An Experimental Study of the Theory of Structural Balance," *Human Relations*, Vol. 11, 1958, pp. 239–254.

[13] Newcomb, *op. cit.*

[14] T. M. Newcomb, "The Prediction of Interpersonal Attraction," *American Psychologist*, Vol. 11, 1956, pp. 575–586.

[15] L. Festinger, K. Back, S. Schachter, H. H. Kelley, and J. Thibaut, *Theory and Experiment in Social Communication*, Ann Arbor, Mich., University of Michigan, Institute for Social Research, 1950.

balanced and unbalanced situations.[16] They observed significant differences in skin resistance depending on whether the subjects agreed or disagreed with a "well-liked experimenter." In the second experiment Burdick and Burnes found that subjects who liked the experimenter tended to change their opinions toward greater agreement with his, and those who disliked him, toward greater disagreement. There are, of course, many other studies to show that the attitude toward the communicator determines his persuasive effectiveness. Hovland and his co-workers have demonstrated these effects in several studies.[17] They have also shown, however, that these effects are fleeting; that is, the attitude change produced by the communication seems to dissipate over time. Their interpretation is that over time subjects tend to dissociate the source from the message and are therefore subsequently less influenced by the prestige of the communicator. This proposition was substantiated by Kelman and Hovland,[18] who produced attitude changes with a prestigeful communicator and retested subjects after a four-week interval with and without reminding the subjects about the communicator. The results showed that the permanence of the attitude change depended on the association with the source.

In general, the consequences of balance theories have up to now been rather limited. Except for Newcomb's longitudinal study, the experimental situations dealt mostly with subjects who responded to hypothetical situations, and direct evidence is scarce. The Burdick and Burnes experiment is the only one bearing more directly on the assumption that imbalance or asymmetry produces tension. Cartwright and Harary's mathematization of the concept of balance should, however, lead to important empirical and theoretical developments. One difficulty is that there really has not been a serious experimental attempt to *disprove* the theory. It is conceivable that some situations defined by the theory as unbalanced may in fact remain stable and produce no significant pressures toward balance. Festinger once inquired in a jocular mood if it followed from balance theory that since he likes chicken, and since chickens like chicken feed, he must also like chicken feed or else experience the tension of imbalance. While this counterexample is, of course, not to be taken seriously, it does point to some difficulties in the concepts of balance. It is not clear from Heider's theory of balance and Newcomb's theory of symmetry what predictions are to be made when attraction of both P and O toward X exists but when the origin and nature of these attractions are different. In other words, suppose both P and O like X but for different rea-

[16] H. A. Burdick and A. J. Burnes, "A Test of 'Strain toward Symmetry' Theories," *Journal of Abnormal and Social Psychology*, Vol. 57, 1958, pp. 367–369.

[17] C. I. Hovland, I. L. Janis, and H. H. Kelley, *Communication and Persuasion: Psychological Studies of Opinion Change*, New Haven, Conn., Yale University Press, 1953.

[18] H. C. Kelman and C. I. Hovland, "'Reinstatement' of the Communicator in Delayed Measurement of Opinion Change." *Journal of Abnormal and Social Psychology*, Vol. 48, 1953, pp. 327-335.

sons and in entirely different ways, as was the case with Festinger and the chickens. Are the consequences of balance theory the same then as in the case where P and O like X for the same reasons and in the same way? It is also not clear, incidentally, what the consequences are when the relation between P and O is cooperative and when it is competitive. Two men vying for the hand of the same fair maiden might experience tension whether they are close friends or deadly enemies.

In a yet unpublished study conducted by Harburg and Price at the University of Michigan, students were asked to name two of their best friends. When those named were of opposite sexes, subjects reported they would feel uneasy if the two friends liked one another. In a subsequent experiment subjects were asked whether they desired their good friend to like, be neutral to, or dislike one of their strongly disliked acquaintances, and whether they desired the disliked acquaintance to like or dislike the friend. It will be recalled that in either case a balanced state obtains only if the two persons are negatively related to one another. However, Harburg and Price found that 39 per cent desired their friend to be liked by the disliked acquaintance, and only 24 per cent to be disliked. Moreover, faced with the alternative that the disliked acquaintance dislikes their friend, 55 per cent as opposed to 25 per cent expressed uneasiness. These results are quite inconsistent with balance theory. Although one may want one's friends to dislike one's enemies, one may not want the enemies to dislike one's friends. The reason for the latter may be simply a concern for the friends' welfare.

OSGOOD AND TANNENBAUM'S
PRINCIPLE OF CONGRUITY

The principle of congruity, which is in fact a special case of balance, was advanced by Osgood and Tannenbaum in 1955.[19] It deals specifically with the problem of *direction* of attitude change. The authors assume that "judgmental frames of reference tend toward maximal simplicity." Thus, since extreme "black-and-white," "all-or-nothing" judgments are simpler than refined ones, valuations tend to move toward extremes for in the words of the authors, there is "a continuing pressure toward polarization." Together with the notion of maximization of simplicity is the assumption of identity as being less complex than the discrimination of fine differences. Therefore, related "concepts" will tend to be evaluated in a similar manner. Given these assumptions, the principle of congruity holds that when change in evaluation or attitude occurs it always occurs in the direction of increased congruity with the prevailing frame of reference. The paradigm of congruity is that of an individual who is confronted with an assertion regarding a particular matter about which he believes and feels in a cer-

[19] Osgood and Tannenbaum, *op. cit.*
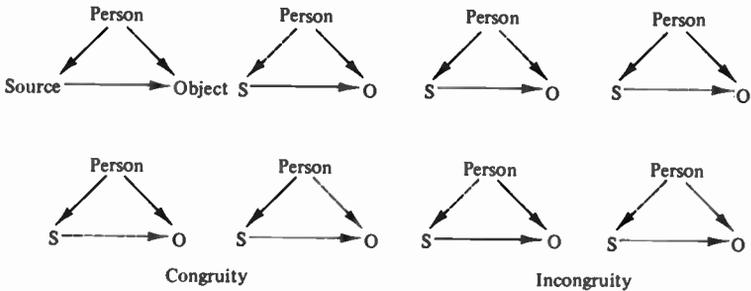
FIGURE 2. Examples of congruity and incongruity. Heavy lines represent assertions, light lines represent attitudes. Solid heavy lines represent assertions which imply a positive attitude on the part of the source, and broken heavy lines, negative attitudes. Solid light lines represent positive, and broken light lines negative, attitudes.

tain way, made by a person toward whom he also has some attitude. Given that Eisenhower is evaluated positively and freedom of the press also positively, and given that Eisenhower $(+)$ comes out in favor of freedom of the press $(+)$, congruity is said to exist. But given that the *Daily Worker* is evaluated negatively, and given that the *Daily Worker* $(-)$ comes out in favor of freedom of the press $(+)$, incongruity is said to exist. Examples of congruity and incongruity are shown in Figure 2. The diagram shows the attitudes of a given individual toward the source and the object of the assertion. The assertions represented by heavy lines imply either positive or negative attitudes of the source toward the object. It is clear from a comparison of Figures 1 and 2 that in terms of their formal properties, the definitions of balance and congruity are identical. Thus, incongruity is said to exist when the attitudes toward the source and the object are similar and the assertion is negative, or when they are dissimilar and the assertion is positive. In comparison, unbalanced states are defined as having either one or all negative relations, which is of course equivalent to the above. To the extent that the person's attitudes are congruent with those implied in the assertion, a stable state exists. When the attitudes toward the person and the assertion are incongruent, there will be a tendency to change the attitudes toward the person and the object of the assertion in the direction of increased congruity. Tannenbaum obtained measures on 405 college students regarding their attitudes toward labor leaders, the *Chicago Tribune*, and Senator Robert Taft as sources, and toward legalized gambling, abstract art, and accelerated college programs as objects. Some time after the attitude scores were obtained, the subjects were presented with "highly realistic" newspaper clippings involving assertions made by the various sources regarding the concepts. In general, when the original attitudes toward the source and the concept were both positive and the assertion presented in the newspaper clippings was also positive, no significant attitude changes were observed in the results. When the original attitudes toward the

source and the concept were negative and the assertion was positive, again no changes were obtained. As predicted, however, when a positively valued source was seen as making a positive assertion about a negatively valued concept, the attitude toward the source became less favorable, and toward the concept more favorable. Conversely, when a negatively valued source was seen as making a positive assertion about a positively valued concept, attitudes toward the source became more favorable and toward the concept less favorable. The entire gamut of predicted changes was confirmed in Tannenbaum's data; it is summarized in the accompanying table, in which the direction of change is represented by either a plus or a minus sign, and the extent of change by either one or two such signs.

CHANGE OF ATTITUDE TOWARD THE SOURCE AND THE OBJECT
WHEN POSITIVE AND NEGATIVE ASSERTIONS ARE MADE BY THE SOURCE

Original Attitude toward the Source	*Positive Assertion about an Object toward Which the Attitude Is*		*Negative Assertion about an Object toward Which the Attitude Is*	
	Positive	*Negative*	*Positive*	*Negative*
	CHANGE OF ATTITUDE TOWARD THE SOURCE			
Positive	+	− −	− −	+
Negative	+ +	−	−	+ +
	CHANGE OF ATTITUDE TOWARD THE OBJECT			
Positive	+	+ +	− −	−
Negative	− −	−	+	+ +

A further derivation of the congruity principle is that incongruity does not invariably produce attitude change, but that it may at times lead to incredulity on the part of the individual. When confronted by an assertion which stands in an incongruous relation to the person who made it, there will be a tendency not to believe that the person made the assertion, thus reducing incongruity.

There is a good deal of evidence supporting Osgood and Tannenbaum's principle of congruity. As early as 1921, H. T. Moore had subjects judge statements for their grammar, ethical infringements for their seriousness, and resolutions of the dominant seventh chord for their dissonance.[20] After two and one-half months the subjects returned and were presented with judgments of "experts." This experimental manipulation resulted in 62 per cent reversals of judgments on grammar, 50 per cent of ethical judgments, and 43 per cent of musical judgments. And in 1935 in a study on a similar problem of prestige suggestion, Sherif let subjects rank sixteen authors for their literary merit.[21] Subsequently, the subjects were given sixteen passages presumably written by the various au-

[20] H. T. Moore, "The Comparative Influence of Majority and Expert Opinion," *American Journal of Psychology*, Vol. 32, 1921, pp. 16–20.

[21] M. Sherif, "An Experimental Study of Stereotypes," *Journal of Abnormal and Social Psychology*, Vol. 29, 1935, pp. 371–375.

thors previously ranked. The subjects were asked to rank-order the passages for literary merit. Although in actuality *all* the passages were written by Robert Louis Stevenson, the subjects were able to rank the passages. Moreover, the correlations between the merit of the author and the merit of the passage ranged from between .33 to .53. These correlations are not very dramatic, yet they do represent some impact of attitude toward the source on attitude toward the passage.

With respect to incredulity, an interesting experiment was conducted recently by Jones and Kohler in which subjects learned statements which either supported their attitudes or were in disagreement with them.[22] Some of the statements were plausible and some implausible. The results were rather striking. Subjects whose attitudes favored segregation learned plausible pro-segregation statements and implausible anti-segregation statements much more rapidly than plausible anti-segregation and implausible pro-segregation statements. The reverse was of course true for subjects whose attitudes favored desegregation.

While the principle of congruity presents no new ideas, it has a great advantage over the earlier attempts in its precision. Osgood and Tannenbaum have formulated the principle of congruity in quantitative terms allowing for precise predictions regarding the extent and direction of attitude change—predictions which in their studies were fairly well confirmed. While balance theory allows merely a dichotomy of attitudes, either positive or negative, the principle of congruity allows refined measurements using Osgood's method of the semantic differential.[23] Moreover, while it is not clear from Heider's statement of balance in just what direction changes will occur when an unbalanced state exists, such predictions can be made on the basis of the congruity principle.

FESTINGER'S THEORY OF COGNITIVE DISSONANCE

Perhaps the largest systematic body of data is that collected in the realm of Festinger's dissonance theory. The statement of the dissonance principle is simple. It holds that two elements of knowledge ". . . are in dissonant relation if, considering these two alone, the obverse of one element would follow from the other." [24] It further holds that dissonance ". . . being psychologically uncomfortable, will motivate the person to try to reduce dissonance and achieve consonance" and ". . . in addition to trying to reduce it, the person will actively avoid situations and information which would likely increase the dissonance." [25] A number of

    [22] E. E. Jones and R. Kohler, "The Effects of Plausibility on the Learning of Controversial Statements," *Journal of Abnormal and Social Psychology*, Vol. 57, 1958, pp. 315–320.
    [23] C. E. Osgood, "The Nature and Measurement of Meaning," *Psychological Bulletin*, Vol. 49, 1952, pp. 197–237.
    Festinger, *op. cit.*, p. 13.
    Ibid., p. 3.

rather interesting and provocative consequences follow from Festinger's dissonance hypothesis.

First, it is predicted that all decisions or choices result in dissonance to the extent that the alternative not chosen contains positive features which make it attractive also, and the alternative chosen contains features which might have resulted in rejecting it. Hence after making a choice people seek evidence to confirm their decision and so reduce dissonance. In the Ehrlich experiment cited by Cohen . . . the finding was that new car owners noticed and read ads about the cars they had recently purchased more than ads about other cars.[26]

Post-decision dissonance was also shown to result in a change of attractiveness of the alternative involved in a decision. Brehm had female subjects rate eight appliances for desirability.[27] Subsequently, the subjects were given a choice between two of the eight products, given the chosen product, and after some interpolated activity (consisting of reading research reports about four of the appliances) were asked to rate the products again. Half the subjects were given a choice between products which they rated in a similar manner, and half between products on which the ratings differed. Thus in the first case higher dissonance was to be expected than in the second. The prediction from dissonance theory that there should be an increase in the attractiveness of the chosen alternative and decrease in the attractiveness of the rejected alternative was on the whole confirmed. Moreover, the further implication was also confirmed that the pressure to reduce dissonance (which was accomplished in the above experiment by changes in attractiveness of the alternatives) varies directly with the extent of dissonance.

Another body of data accounted for by the dissonance hypothesis deals with situations in which the person is forced (either by reward or punishment) to express an opinion publicly or make a public judgment or statement which is contrary to his own opinions and beliefs. In cases where the person actually makes such a judgment or expresses an opinion contrary to his own as a result of a promised reward or threat, dissonance exists between the knowledge of the overt behavior of the person and his privately held beliefs. Festinger also argues that in the case of noncompliance dissonance will exist between the knowledge of overt behavior and the anticipation of reward and punishment.

An example of how dissonance theory accounts for forced-compliance data is given by Brehm.[28] Brehm offered prizes to eighth-graders for eating disliked vegetables and obtained measures of how well the children liked the vegetables. Children who ate the vegetables increased their liking for them. Of course, one

[26] D. Ehrlich, I. Guttman, P. Schönbach, and J. Mills, "Post-decision Exposure to Relevant Information," *Journal of Abnormal and Social Psychology*, Vol. 54, 1957, pp. 98–102.

[27] J. Brehm, "Post-decision Changes in the Desirability of Alternatives," *Journal of Abnormal and Social Psychology*, Vol. 52, 1956, pp. 384–389.

[28] J. Brehm, "Increasing Cognitive Dissonance by a *Fait Accompli*," *Journal of Abnormal and Social Psychology*, Vol. 58, 1959, pp. 379–382.

might argue that a simpler explanation of the results is that the attractiveness of the prize generalized to the vegetable, or that, even more simply, the vegetables increased in utility because a reward came with them. However, this argument would also lead one to predict that the increment in attraction under such conditions is a *direct* function of the magnitude of the reward. Dissonance theory makes the opposite prediction, and therefore a test of the validity of the two explanations is possible. Data collected by Festinger and Carlsmith [29] and by Aronson and Mills [30] support the dissonance point of view. In Festinger and Carlsmith's experiment subjects were offered either $20 or $1 for telling someone that an experience which had actually been quite boring had been rather enjoyable and interesting. When measures of the subjects' private opinions about their actual enjoyment of the task were taken, those who were to be paid only $1 for the false testimony showed considerably higher scores than those who were to be paid $20. Aronson and Mills, on the other hand, tested the effects of negative incentive. They invited college women to join a group requiring them to go through a process of initiation. For some women the initiation was quite severe, for others it was mild. The prediction from dissonance theory that those who had to undergo severe initiation would increase their attraction for the group more than those having no initiation or mild initiation was borne out.

A third set of consequences of the theory of dissonance deals with exposure to information. Since dissonance occurs between cognitive elements, and since information may lead to change in these elements, the principle of dissonance should have a close bearing on the individual's commerce with information. In particular, the assumption that dissonance is a psychologically uncomfortable state leads to the prediction that individuals will seek out information reducing dissonance and avoid information increasing it. The study on automobile-advertising readership described above is a demonstration of this hypothesis. [31] In another study Mills, Aronson, and Robinson gave college students a choice between an objective and a necessary examination. [32] Following the decision, the subjects were given articles about examinations presumably written by experts, and they were asked if they would like to read them. In addition, in order to vary the intensity of dissonance, half the subjects were told that the examination counted 70 per cent toward the final grade, and half that it counted only 5 per cent. The data were obtained in the form of rankings of the articles for preference. While there was a clear preference for reading articles containing positive information about

[29] L. Festinger and J. M. Carlsmith, "Cognitive Consequences of Forced Compliance," *Journal of Abnormal and Social Psychology*, Vol. 58, 1959, pp. 203–210.

[30] E. Aronson and J. Mills, "The Effect of Severity of Initiation on Liking for a Group," *Journal of Abnormal and Social Psychology*, Vol. 59, 1959, pp. 177–181.

[31] Ehrlich *et al.*, *op. cit.*

[32] J. Mills, E. Aronson, and H. Robinson, "Selectivity in Exposure to Information," *Journal of Abnormal and Social Psychology*, Vol. 59, 1959, pp. 250–253.

the alternative chosen, no significant selective effects were found when the articles presented arguments against the given type of examination. Also, the authors failed to demonstrate effects relating selectivity in exposure to information to the magnitude of dissonance, in that no significant differences were found between subjects for whom the examination was quite important (70 per cent of the final grade) and those for whom it was relatively unimportant (5 per cent of the final grade).

Festinger was able to account for many other results by means of the dissonance principle, and in general his theory is rather successful in organizing a diverse body of empirical knowledge by means of a limited number of fairly reasonable assumptions. Moreover, from these reasonable assumptions dissonance theory generated several nontrivial and nonobvious consequences. The negative relationship between the magnitude of incentive and attraction of the object of false testimony is not at all obvious. Also not obvious is the prediction of an increase in proselytizing for a mystical belief following an event that clearly contradicts it. Festinger, Riecken, and Schachter studied a group of "seekers"—people who presumably received a message from outer space informing them of an incipient major flood.[33] When the flood failed to materialize on the critical date, instead of quietly withdrawing from the public scene, as one would expect, the "Seekers" summoned press representatives, gave extended interviews, and invited the public to visit them and be informed of the details of the whole affair. In a very recent study by Brehm, a "nonobvious" derivation from dissonance theory was tested.[34] Brehm predicted that when forced to engage in an unpleasant activity, an individual's liking for this activity will increase more when he receives information essentially berating the activity than when he receives information promoting it. The results tended to support Brehm's prediction. Since negative information is said to increase dissonance, and since increased dissonance leads to an increased tendency to reduce it, and since the only means of dissonance reduction was increasing the attractiveness of the activity, such an increase would in fact be expected.

CONCLUSIONS

The theories and empirical work dealing with consistencies are mainly concerned with intra-individual phenomena, be it with relationships between one attitude and another, between attitudes and values, or information, or perception, or behavior, or the like. One exception is Newcomb's concept of "strain toward sym-

[33] L. Festinger, J. Riecken, and S. Schachter, *When Prophecy Fails*, Minneapolis, University of Minnesota Press, 1956.

[34] J. W. Brehm, "Attitudinal Consequences of Commitment to Unpleasant Behavior," *Journal of Abnormal and Social Psychology*, Vol. 60, 1960, pp. 379–383.

metry." Here the concern is primarily with the interplay of forces among individuals which results in uniformities or consistencies among them. There is no question that the concepts of consistency, and especially the theory of cognitive dissonance, account for many varied attitudinal phenomena. Of course, the various formulations of consistency do not pretend, nor are they able, to account completely for the phenomena they examine. Principles of consistency, like all other principles, are prefaced by the *ceteris paribus* preamble. Thus, when other factors are held constant, then the principles of consistency should be able to explain behavior and attitudes completely. But the question to be raised here is just what factors must be held constant and how important and significant, relative to consistency, are they.

Suppose a man feels hostile toward the British and also dislikes cricket. One might be tempted to conclude that if one of his attitudes were different he would experience the discomfort of incongruity. But there are probably many people whose attitudes toward the British and cricket are incongruent, although the exact proportions are not known and are hardly worth serious inquiry. But if such an inquiry were undertaken it would probably disclose that attitudes depend largely on the conditions under which they have been acquired. For one thing, it would show that the attitudes depend at least to some extent on the relationship of the attitude object to the individual's needs and fears, and that these may be stronger than forces toward balance. There are in this world things to be avoided and feared. A child bitten by a dog will not develop favorable attitudes toward dogs. And no matter how much he likes Popeye you can't make him like spinach, although according to balance theory he should.

The relationship between attitudes and values or needs has been explored, for instance, in *The Authoritarian Personality*, which appeared in 1950.[35] The authors of this work hypothesized a close relationship between attitudes and values on the one hand and personality on the other. They assumed that the ". . . convictions of an individual often form a broad and coherent pattern, as if bound together by a mentality or spirit." They further assumed that ". . . opinions, attitudes, and values depend on human needs and since personality is essentially an organization of needs, then personality may be regarded as a determinant of ideological preference." Thus *The Authoritarian Personality* approach also stresses consistency, but while the concepts of congruity, balance, and dissonance are satisfied with assuming a general tendency toward consistency, *The Authoritarian Personality* theory goes further in that it holds that the dynamic of consistency is to be found in personality, and it is personality which gives consistency meaning and direction. Attitudes and values are thus seen to be consistent among themselves and with one another because they are both con-

[35] T. W. Adorno, E. Frenkel-Brunswik, D. J. Levinson, and R. N. Sanford, *The Authoritarian Personality*, New York, Harper, 1950.

sistent with the basic personality needs, and they are consistent with needs because they are determined by them.

The very ambitious research deriving from *The Authoritarian Personality* formulation encountered many difficulties and, mainly because of serious methodological and theoretical shortcomings, has gradually lost its popularity. However, some aspects of this general approach have been salvaged by others. Rosenberg, for instance, has shown that attitudes are intimately related to the capacity of the attitude object to be instrumental to the attainment of the individual's values.[36] Carlson went a step further and has shown that, if the perceived instrumentality of the object with respect to a person's values and needs is changed, the attitude itself may be modified.[37] These studies, while not assuming a general consistency principle, illustrate a special instance of consistency, namely that between attitudes and utility, or instrumentality of attitude objects, with respect to the person's values and needs.

The concepts of consistency bear a striking historical similarity to the concept of vacuum. According to an excellent account by Conant,[38] for centuries the principle that nature abhors a vacuum served to account for various phenomena, such as the action of pumps, behavior of liquids in joined vessels, suction, and the like. The strength of everyday evidence was so overwhelming that the principle was seldom questioned. However, it was known that one cannot draw water to a height of more than 34 feet. The simplest solution of this problem was to reformulate the principle to read that "nature abhors a vacuum below 34 feet." This modified version of *horror vacui* again was satisfactory for the phenomena it dealt with, until it was discovered that "nature abhors a vacuum below 34 feet only when we deal with water." As Torricelli has shown, when it comes to mercury "nature abhors a vacuum below 30 inches." Displeased with the crudity of a principle which must accommodate numerous exceptions, Torricelli formulated the notion that it was the pressure of air acting upon the surface of the liquid which was responsible for the height to which one could draw liquid by the action of pumps. The 34-foot limit represented the weight of water which the air pressure on the surface of earth could maintain, and the 30-inch limit represented the weight of mercury that air pressure could maintain. This was an entirely different and revolutionary concept, and its consequences had drastic impact on physics. Human nature, on the other hand, is said to abhor inconsistency. For the time being the principle is quite adequate, since it accounts sys-

[36] M. J. Rosenberg, "Cognitive Structure and Attitudinal Affect," *Journal of Abnormal and Social Psychology*, Vol. 53, 1956, pp. 367–372.

[37] E. R. Carlson, "Attitude Change through Modification of Attitude Structure," *Journal of Abnormal and Social Psychology*, Vol. 52, 1956, pp. 256–261.

[38] James B. Conant, *On Understanding Science*, New Haven, Conn., Yale University Press, 1947.

tematically for many phenomena, some of which have never been explained and all of which have never been explained by one principle. But already today there are exceptions to consistency and balance. Some people who spend a good portion of their earnings on insurance also gamble. The first action presumably is intended to protect them from risks, the other to expose them to risks. Almost everybody enjoys a magician. And the magician only creates dissonance—you see before you an event which you know to be impossible on the basis of previous knowledge—the obverse of what you see follows from what you know. If the art of magic is essentially the art of producing dissonance, and if human nature abhors dissonance, why is the art of magic still flourishing? If decisions are necessarily followed by dissonance, and if nature abhors dissonance, why are decisions ever made? Although it is true that those decisions which would ordinarily lead to great dissonance take a very long time to make, they are made anyway. And it is also true that human nature does not abhor dissonance absolutely, as nature abhors a vacuum. Human nature merely avoids dissonance, and it would follow from dissonance theory that decisions whose instrumental consequences would not be worth the dissonance to follow would never be made. There are thus far no data to support this hypothesis, nor data to disprove it.

According to Conant, *horror vacui* served an important purpose besides explaining and organizing some aspects of physical knowledge. Without it the discomfort of "exceptions to the rule" would never have been felt, and the important developments in theory might have been delayed considerably. If a formulation had then a virtue in being wrong, the theories of consistency do have this virtue. They do organize a large body of knowledge. Also, they point out exceptions, and thereby they demand a new formulation. It will not suffice simply to reformulate them so as to accommodate the exceptions. I doubt if Festinger would be satisfied with a modification of his dissonance principle which would read that dissonance, being psychologically uncomfortable, leads a person to actively avoid situations and information which would be likely to increase the dissonance, except when there is an opportunity to watch a magician. Also, simply to disprove the theories by counter-examples would not in itself constitute an important contribution. We would merely lose explanations of phenomena which had been explained. And it is doubtful that the theories of consistency could be rejected simply *because* of counterexamples. Only a theory which accounts for all the data that the consistency principles now account for, for all the exceptions to those principles, and for all the phenomena which these principles should now but do not consider, is capable of replacing them. It is only a matter of time until such a development takes place.

A SUMMARY OF EXPERIMENTAL RESEARCH IN ETHOS

Kenneth Andersen and Theodore Clevenger, Jr.

Although the number of quantitative studies employing the term *ethos* in their titles is small, related rubrics such as *credibility* and *prestige* encompass such a quantity and variety of research clearly related to this classical concept that a summary should be valuable to those undertaking further studies. The primary purpose of this paper is to provide such a summary. In this study *ethos* is defined as the image held of a communicator at a given time by a receiver—either one person or a group. The use of the words *communicator* and *receiver* is deliberate, for the writers have chosen to include studies of written and nonverbal communication as well as those involving a speaker-auditor relationship.

The major sections of this paper are summaries of experimental findings pertaining to (1) the influence of ethos upon the effect of the communication, (2) techniques for generating or changing ethos, and (3) measurements of one or more aspects of ethos and attempts to assess the relative levels of ethos of individuals or groups.

INFLUENCE OF ETHOS UPON THE INTENDED
EFFECT OF THE COMMUNICATION

Experiments concerning ethos have dealt with many and varied topics: with the effects of differences in prestige, credibility, likeableness, and other variables upon attitudes toward political-social issues, upon evaluations of art and literature, and upon learning; with the relative effectiveness of majority and expert opinion and the relative susceptibility of the sexes, different age groups, and persons of various educational levels to *prestige* suggestion; and with the temporal effects and the permanency of the attitude change and the learning induced by different levels of ethos.

It is important to remember that these studies, which arise from such fields as psychology, speech, sociology, and education, are quite diverse in origin, that many of the experimenters did not use rhetorical terminology, and that many of them also did not perceive a relationship between their studies and ethos. Studies are included, however, if the independent variable is a difference in treatment which is basically related to ethos and if the dependent variable is some measurement which is basically a communication effect index.

THEORETICAL AND METHODOLOGICAL DIFFERENCES

Studies differ so much in the definition of ethos and in certain other theoretical and methodological features that an analysis of these distinctions is a necessary preliminary to reporting the experiments.

1. FIXED ETHOS VS. CONGRUITY HYPOTHESIS.   In most studies the ethical element is treated as relatively fixed in value during the communication act, and persuasion is construed as the linking of a proposition with an *approved* source for a positive effect or a *disapproved* source for a negative one.[1] However, in some recent studies, especially those using semantic differential measurement, ethos is regarded as flexible, because during the act of communication alterations in the image of the speaker may be caused either by the sender's propositions or by other situational factors.[2]

2. ETHOS ASSUMED VS. ETHOS MEASURED.   Early studies of ethical effects commonly followed the pattern of employing two sources (such as Franklin Roosevelt and Herbert Hoover) assumed to differ greatly in credibility, prestige, or some other ethical component and then comparing the attitude change for

[1] Such as John Highlander, "Audience Analyzer Measurements and Informational Effects of Speaker Variables in Radio Talks," unpubl. diss. (Wisconsin, 1953); Franklyn Haiman, "An Experimental Study of the Effects of Ethos in Public Speaking," unpubl. diss. (Northwestern, 1948); also briefly reported in *SM*, XVI (Sept., 1949), 190–202.

[2] Such as Charles Osgood, George Suci and Percy Tannenbaum, *The Measurement of Meaning* (Urbana: University of Illinois Press, 1957); Erwin Bettinghaus, "The Operation of Congruity in an Oral Communication Situation," unpubl. diss. (Illinois, 1959).

Group I, which received the message credited to the first source, with that for Group II, which received the same message except that it was ascribed to the second source.[3] This method assumes that for the group of subjects in question, the experimenter can determine intuitively the relative levels of ethos of the given sources. Recent studies, in contrast, have tended to measure ethos. Experimenters have either selected their sources on the basis of pretests of credibility or chosen them arbitrarily and then checked for credibility differences by direct measurement after the completion of the experiment.[4] The last of these techniques, of course, is valid only if one is willing to espouse the fixed ethos model; for if the image of the speaker may change during the speech, a measurement rendered after the address may be quite deceptive concerning ethos at the outset.

3. TOPIC-ORIENTED VS. TOPIC IRRELEVANT ETHOS. The assumption for the majority of the studies apparently is that the prestige, the credibility, or some other ethical characteristic of the speaker varies from one topic to another. Thus, in most of the studies of *expert* opinion the authorities were selected because they were reputed to be well informed on the topic of the experimental message.[5] Some studies, on the other hand, seem to be based on a concept of generalized credibility and to discount or ignore the possibility that the prestige varies from topic to topic.[6]

4. AVERAGE VS. INDIVIDUAL MEASURE. Although the assumption in most studies is that the experimental group as an entity places the communicator at a certain level of prestige,[7] in some studies ethos is regarded as differing from one subgroup to another, and data are treated separately for such variables as sex, occupation, educational status, and political affiliation.[8] A few studies even consider the prestige of the source in respect to each individual auditor.[9] Whereas

[3] Such as Helen Lewis, "Studies in the Principles of Judgments and Attitudes: IV. The Operation of 'Prestige Suggestion,'" *Journal of Social Psychology*, XIV (1941), 229–256.

[4] Such as Muzafer Sherif, "An Experimental Study of Stereotypes," *Journal of Abnormal and Social Psychology*, XXIX (1935), 371–375; Herbert Kelman and Carl Hovland, "'Reinstatement' of the Communicator in Delayed Measurement of Opinion Change," *Journal of Abnormal and Social Psychology*, XLVIII (1953), 327–335.

[5] Such as Malcolm Moos and Bertram Koslin, "Prestige Suggestion and Political Leadership," *Public Opinion Quarterly*, XVI (1952), 77–93; Irving Lorge with Carl Curtis, "Prestige, Suggestion and Attitudes," *Journal of Social Psychology*, VII (1936), 386–402.

[6] Such as Clare Marple, "The Comparative Susceptibility of Three Age Levels to the Suggestion of Group Versus Expert Opinion," *Journal of Social Psychology*, IV (1933), 176–186.

[7] Such as Raymond Bernberg, "Prestige Suggestion in Art as Communication," *Journal of Social Psychology*, XXXVIII (1953), 23-30; William Michael, Bernard Rosenthal, and Michael DeCamp, "An Experimental Investigation of Prestige-Suggestion for Two Types of Literary Material," *Journal of Psychology*, XXVIII (1949), 303–323.

[8] Such as Helen Lewis, *loc. cit.*

[9] Such as Herbert Birch, "The Effect of Socially Disapproved Labeling upon a Well-Structured Attitude," *Journal of Abnormal and Social Psychology*, XL (1945), 301–310; David Cole, "'Rational Argument' and 'Prestige-Suggestion' as Factors Influencing Judgment," *Sociometry*, XVII (1954), 350–354.

in the first two types of experiment the usual statistical test is for the significance of difference between means, in studies of the individual auditor the common method is correlation.

5. EXTENT OF AUDIENCE ANALYSIS.   Finally, the studies differ in that some examine audience characteristics, whereas others do not. Both approaches have interpretative hazards as well as distinctive advantages. In studies which assess the effect upon attitude change of such audience properties as sex, age, and educational level it is also possible (although infrequently done) to investigate the interaction of ethos with each of the audience variables. Thus, a study in which two levels of prestige are employed with an audience of men and women can include data on the effect of prestige level upon attitude change (ignoring sex), the difference in the persuasibility of the sexes (ignoring prestige), and differences in the relative susceptibility of the two sexes to prestige and nonprestige communication (the interactions). Careful interpretation, however, is necessary: First, the experimenter must distinguish over-all persuasibility differences between the sexes (main effect of sex) from prestige-suggestibility (the interaction). Second, where prestige is taken with reference to the entire sample of subjects, he must note the possibility of confounding prestige level with sex—that is, a source may not have the same prestige for the two sexes, and this difference may result in a spurious sex-by-prestige level interaction if prestige level is measured as a group average. Thus, some of the results seeming to show greater prestige-persuasibility for women than for men may have been products of concealed differences in the prestige level of the source for the two sexes.

Within the limits of the five methodological distinctions described above, the studies of the effects of ethos present a reasonably harmonious body of findings. In the following pages those studies employing the conception of a fixed ethos model will be presented first, and the limited number employing the congruity model will follow.

STUDIES ASSUMING THAT ETHOS IS FIXED

A number of studies which employ the relatively common fixed ethos model indicate that certain ethical factors can produce changes in attitude toward political and social issues. Arnett, Davidson, and Lewis found that a group of graduate students shifted significantly toward agreement with graduate educators on Harper's test of liberalism.[10] The study was conducted without a control group, however, and during the lapse of four weeks between the two administrations of the test, factors other than prestige may have operated to produce the observed shifts.

Birch studied the effect of political labels of *Fascist* or *Communist* and *Reactionary* or *Liberal* on college students' judgments of two statements.[11] No signi-

[10] Claude Arnett, Helen Davidson, and Hallett Lewis, "Prestige as a Factor in Attitude Changes," *Sociology and Social Research*, XVI (1931), 49–55.

[11] *Loc. cit.*

ficant differences in preference for the two statements were observed, but this conclusion may be misleading. The fact that ninety-nine per cent of all subjects favored one statement over the other may have masked any possible prestige effect.

While the preceding studies were concerned with the effect of referential group or class prestige upon attitude change, a number of studies have been directed toward an investigation of the prestige of individuals. Saadi and Farnsworth found greater acceptance for dogmatic statements which were attributed to well-liked persons than to the same assertions when attributed to disliked individuals.[12] Lorge and Curtis found a significant tendency for subjects to shift opinion toward the supposed position of a prestige source, but they found no significant negative shift when the proposition was linked with a disapproved source.[13]

In apparent conflict with these findings are the results obtained by Lewis. She reported that college students remained relatively unchanged in the evaluation of statements and that they tried to explain away the "prestige source" through rationalization.[14] Unhappily, the conclusions to the study show the bias of an author who quite evidently hoped to support an hypothesis: for example, she describes rank-order correlations of a magnitude of .50 as "high." This bias renders suspect the assertion that informal interviews with the subjects and free responses revealed that suggestion, when effective, usually redefined an ambiguous situation.

A more satisfactory design for testing a similar hypothesis was that employed by Moos and Koslin, who discovered that vague quotations were those which were the most likely to be influenced by attribution to differing sources.[15]

Hastorf and Piper, using a variety of problems, studied the effects of supposed ratings of businessmen and educators on the attitudes of subjects. They found that all groups, including one which was instructed to duplicate its pretest responses and ignore the supposed ratings, shifted significantly.[16]

Smith found that printed propaganda statements when labeled as fact produced greater belief than when labeled as rumor. The success of the "fact" label, however, clearly varied with the prior attitude of the subject and with the relation of the alleged "fact" to truth.[17]

The objective of all of the above studies was to assess the effects of prestige

[12] Mitchell Saadi and Paul Farnsworth, "The Degrees of Acceptance of Dogmatic Statements and Preferences for Their Supposed Makers," *Journal of Abnormal and Social Psychology*, XXIX (1934), 143–150.

[13] *Loc. cit.*

[14] *Loc. cit.*

[15] *Loc. cit.*

[16] A. H. Hastorf and G. W. Piper, "A Note on the Effect of Explicit Instructions on Prestige Suggestion." *Journal of Social Psychology*, XXXIII (1951), 289–293.

[17] George Smith, "Belief in Statements Labeled Fact and Rumor," *Journal of Abnormal and Social Psychology*, XLII (1947), 80–90.

upon judgment of political and social issues, and the method in all instances was to link a source with a proposition but to provide no message by which the source supported the proposition. A question of more immediate interest to students of speech is whether differences in the speaker's prestige significantly influence the persuasive outcome of a speech.

Haiman presented to three groups a tape-recorded speech variously attributed to Thomas Parran, Surgeon General of the United States; to Eugene Dennis, Secretary of the Communist Party in America; and to a "Northwestern University Sophomore." Not only was Parran rated significantly more competent than the other two, but also, as measured by the Woodward Shift-of-Opinion Ballot, his speech was significantly more effective in changing attitude than was either of the other two. The "Dennis" and the "Sophomore" speeches did not differ significantly.[18]

Employing essentially the same techniques—a tape-recorded speech, differing introductions, and the Woodward ballot—Strother and Paulson in separate studies obtained results similar to Haiman's. Not only did Strother find significant differences in the persuasiveness of the "Parran" and the "Dennis" speeches, but also he noted that only those who thought they had been listening to Dennis wrote unfavorable comments concerning the speech techniques employed.[19] Paulson attributed a taped speech to a political science professor and to a student. For female auditors there was no significant difference in the effects of the "two" speeches, but among the male auditors the proportion of those shifting opinion was greater for the group which thought it had been addressed by the professor.[20]

The supposed differences in prestige level in the experiments cited above were assumed to be quite large, and the methods of establishing the prestige levels were straightforward and obvious. On the other hand, Hovland and Mandell, in an effort to assess subtler sources of the speaker's image, manipulated credibility through the *suggestion* of differing degrees of selfish interest and self-motivation. The nonsignificant difference in attitude change which the speakers produced was very small, but the audiences, apparently reacting to their presumed prejudices, rated the "unbiased source" as the significantly fairer and more honest of the two.[21] Since these evaluations were rendered after the speech, the ini-

[18] *Loc. cit.*

[19] Edward Strother, "An Experimental Study of Ethos as Related to the Introduction in the Persuasive Speaking Situation," unpubl. diss. (Northwestern, 1951).

[20] Stanley Paulson, "Experimental Study of Spoken Communications; The Effects of Prestige of the Speaker and Acknowledgement of Opposing Arguments on Audience Retention and Shift of Opinion," unpubl. diss. (Minnesota, 1952); also briefly reported in *SM*, XXI (1954), 267–271.

[21] Carl Hovland and Wallace Mandell, "An Experimental Comparison of Conclusion Drawing by the Communicator and the Audience," *Journal of Abnormal and Social Psychology*, XLVII (1952), 581–588.

tial ethos of the two sources, the point at which the "biases" of one began to emerge, or the ways in which the images of the two speakers changed during the speech are unknown.

A study by Kraus likewise suggests the possibility of evaluating indirect, implicative sources of ethos. Using pairs which were racially homogeneous and others which were racially heterogeneous, he compared whites with Negroes in respect to their persuasiveness in filmed discussions of segregation issues. The results indicated that arguments favorable to integration were more persuasive when advanced by the heterogeneous pairs, and Kraus explained the results in terms of differing levels of credibility.[22]

All the studies mentioned thus far have dealt with ethos as determined by the position or reputation of the source. Messages, if used, have been standardized so that the only variable was the introduction given the speaker.

Other studies, in contrast, have been designed so that some internal message elements have been varied systematically. Gilkinson, Paulson, and Sikkink, who incorporated or excluded authority quotations in two versions of the same speech, found that both versions engendered a significant shift in attitude with only a trend to favor the inclusion of authorities.[23] In another study Sikkink similarly employed quotations, but neither attitude shift nor ratings of convincingness showed significant differences.[24] While the use of authorities certainly has persuasive implications beyond the ethical dimension (and indeed the authors of these experiments apparently did not consider ethos the critical variable), the fact that the speaker was not evaluated as significantly more convincing when he used authorities suggests that citing reputable sources does not necessarily enhance ethos—as some theorists have suggested.

The two studies above are included within the fixed ethos model because the prestige of the authorities seemingly served directly as the basis for the shift in opinion, if any. Other experimenters varied the procedure by apparently employing authorities for the purpose of altering the image of the speaker; this altered image, in turn, was to serve as the warrant for the persuasive effect. (Possibly both effects could occur.) Studies of attitude changes dependent upon such attempts at artistic ethos are reported in a subsequent section of this paper.[25]

Historically parallel to the study of the effects of ethos upon political and so-

[22] Sidney Kraus, "An Experimental Study of the Relative Effectiveness of Negroes and Whites in Achieving Racial Attitude Change Via Kinescope Recordings," unpubl. diss. (Iowa, 1959) ; *SM*, XXVII (1960), 87–88.

[23] Howard Gilkinson, Stanley Paulson, and Donald Sikkink, "Effects of Order and Authority in an Argumentative Speech," *QJS*, XL (1954), 183–192.

[24] Donald Sikkink, "An Experimental Study of the Effects on the Listener of Anticlimax Order and Authority in an Argumentative Speech," *Southern Speech Journal*, XXII (1956), 73–78.

[25] See p. 212. Still other implications for a theory of ethos stemming from the authority quotation problem will be discussed in a subsequent paper.

cial attitudes has been the study of its effect upon judgments of literature, art, and matters of personal taste. In three experiments in Turkey and at Harvard Sherif found correlations of .45 to .53 between rankings of authors and subsequent rankings of passages to which authors' names were randomly attached. Sherif asserts that the name of the author exerts an influence upon ratings of passages.[26]

Michael, Rosenthal, and DeCamp matched authors with prose and poetry passages and found little evidence of the effect noted by Sherif.[27] Although they claimed methodological improvements over the Sherif study, their rank-of-summed-ranks technique actually produced a measure of dubious statistical reliability.[28] The entire study was conducted in such a manner that results confirming the Sherif finding were highly unlikely. The interpretation of their inconclusive results as evidence contrary to the Sherif hypothesis seems unjustified.

More recently, in India, Das, Rath, and Das studied the effect of author prestige upon evaluations of poetry. Working with quite small groups and crude statistical measures, they concluded that prestige influenced judgment greatly but that this effect was weakened when the factors of understanding and merit were stressed.[29]

Judgments of art seem to be similar. Data obtained by Farnsworth and Misumi displayed a trend indicating that recognition of the artist's name had some favorable effect on the evaluations of pictures.[30] In another experiment Bernberg found that positive and negative evaluations of alleged art critics significantly affected the judgments by artistically naive students with regard to seven of ten paintings.[31]

Cole presented abstract finger paintings for discussion in small groups. In situations in which the art teacher presented judgments in opposition to those of the group, significant shifts occurred only when the teacher was present. A peer leader, to cite a second finding, secured significant shifts only when he also presented pseudo-rational arguments.[32]

Again, similar effects have been found in the area of personal taste and perceptions. Duncker presented a story to nursery school children in which a fictional hero endorses a food actually less desirable than an alternative selection.

[26] *Loc. cit.*

[27] *Loc. cit.*

[28] The problems in the use of a rank-of-summed-ranks technique are discussed by Roger Nebergall, "Some Applications of Measurement Theory to the Judgment of Speech Contests," unpublished paper read at the Central States Speech Association Conference, April 8, 1960.

[29] J. P. Das, R. Rath, and Rhea Stagner Das, "Understanding Versus Suggestion in the Judgment of Literary Passages," *Journal of Abnormal and Social Psychology*, LI (1955), 624–628.

[30] Paul Farnsworth and Issei Misumi, "Further Data on Suggestion in Pictures," *American Journal of Psychology*, XLIII (1931), 632.

[31] *Loc. cit.*

[32] *Loc. cit.*

The after-effect was decidedly positive—a large percentage of the children selected the endorsed food when given a choice. Over a period of twelve days, however, the selection of the less satisfying food declined to the level of a control group. Some of the initial preference for the less desirable food was reinstated by recalling the story, but this effect degenerated very quickly.[33]

Donceel, Alimena, and Birch presented adults and high school and college students with personality descriptions of themselves. These supposedly came from tests and expert evaluations, but actually were determined by chance. Under mild suggestion a significant number of students accepted these statements as valid, and under strong suggestion all subjects yielded. They accepted as true the false descriptions of their personalities and reversed previous answers to questions in a personality test.[34]

Aveling and Hargreaves found *personal suggestion* capable of affecting performance in a variety of perceptual and psychomotor tasks, but they also secured evidence of strong negative suggestibility among some of their subjects.[35]

Although there is little reason to suppose that those elements of ethos which are designed to obtain attitude change are also capable of producing differences in learning, a small number of studies pertain to this possibility. Weiss taught responses to groups of students, one of which was told that the answers were untrue. No differences in learning occurred, but what was learned correlated with the attitude change which took place during the experiment.[36] Paulson found no significant differences in retention between high and low ethos sources, although certain audience variables did appear to be related to learning.[37] Sikkink's results were substantially the same.[38]

An experiment by Harms shows that cloze test scores are somewhat higher when the speakers are high in status than when they are low. The inferred reason for this result is that high-status speakers are more "comprehensible." A further result, secured through a differential analysis of listener groups, is that listeners respond with greater comprehension to those from their own class than to speakers from either a higher or a lower class.[39]

The above studies were concerned with the effects of the ethos of individual

[33] Karl Duncker, "Experimental Modification of Children's Food Preferences Through Social Suggestion," *Journal of Abnormal and Social Psychology*, XXXIII (1938), 489–507.

[34] Joseph Donceel, Benjamin Alimena, and Catherine Birch, "Influence of Prestige Suggestion on the Answers of a Personality Inventory," *Journal of Applied Psychology*, XXXIII (1949), 352-355.

[35] F. Aveling and H. L. Hargreaves, "Suggestibility with and Without Prestige in Children," *British Journal of Psychology*, XII (1921–1922), 53–75.

[36] Walter Weiss, "A 'Sleeper' Effect in Opinion Change," *Journal of Abnormal and Social Psychology*, XLVIII (1953), 173–180.

[37] *Loc. cit.*

[38] *Loc. cit.*

[39] Leroy Stanley Harms, "Social Judgments of Status Cues in Language," unpubl. diss. (Ohio State, 1959); *SM*, XXVII (1960), 87.

communicators. A smaller number of investigations have attempted to compare the effects of expert opinions with those produced by majority opinion.

Using as a criterion the frequency with which the subjects reversed their preferences so as to conform to the prestige group, Moore measured the relative influence of majority and expert opinions upon judgments of grammar, ethics, and music. The two sources were about equally effective except with respect to grammar, where the majority opinion prevailed by a ratio of 10 to 7.[40] The primitive design of this experiment may have concealed other differences.

An experiment by Marple, who found that both the group and experts influenced opinions about solutions to seventy-five assorted problems, reinforced Moore's results. Majority opinion was roughly one-third more effective than expert opinion with students and roughly one-fifth more effective with adults.[41]

With respect to religious beliefs(Burtt and Falkenburg discovered that opinions of both the majority and experts influenced judgments significantly, that expert (clerical) opinions tended to have greater influence than majority views in some matters of religious belief, and that a contrary tendency existed in other areas.[42]

Incidental findings of a number of studies bear upon the question of the relative susceptibility of various audience types to prestige as a means of suggestion. Within the narrow range which an undergraduate psychology class affords, Hovland and Mandell found that personality and intelligence were not related to prestige-suggestibility.[43] Kersten reports a similar finding for intelligence; [44] but Wegrocki reports a tendency for intelligence to be negatively associated with prestige-suggestibility.[45] Strother discovered no shifts in opinion which correlated with either sex or the urban-versus-rural dimension, but he did find that members of the audience with initially neutral views on the speech topic were significantly more responsive to variations of ethos than were either the pro or the con groups.[46] Kersten,[47] Paulson,[48] and Pross [49] obtained results confirming those of Strother.

[40] Henry Moore, "The Comparative Influence of Majority and Expert Opinion," *American Journal of Psychology*, XXXII (1921), 16–20.

[41] *Loc. cit.*

[42] Harold Burtt and Don Falkenberg, Jr., "The Influence of Majority and Expert Opinion on Religious Attitudes," *Journal of Social Psychology*, XIV (1941), 269–278.

[43] *Loc. cit.*

[44] Barbara Kersten, "An Experimental Study to Determine the Effect of a Speech of Introduction upon the Persuasive Speech that Followed," unpubl. thesis (South Dakota State College, 1958).

[45] Henry Wegrocki, "The Effect of Prestige Suggestibility on Emotional Attitudes," *Journal of Social Psychology*, V (1934), 384–394.

[46] *Loc. cit.*

[47] *Loc. cit.*

[48] *Loc. cit.*

[49] Edward Pross, "A Critical Analysis of Certain Aspects of Ethical Proof," unpubl. diss. (Iowa, 1942); Paulson, *loc. cit.*

Sikkink found that women rated the persuasiveness of all speeches significantly higher than did men, but that women were neither easier nor harder to influence than men.[50] Cathcart also concluded that sex was not significantly related to persuasibility.[51] Pross reported some indication that women were the more suggestible, and Wegrocki also concluded that girls, as compared with boys, tended to be more suggestible and to react more strongly to sympathetic propaganda.[52] Paulson found that women reacted more but retained less information. Freshmen, also according to Paulson, tended to shift less in response to the high ethos source than did upper classmen, but there was no guarantee that the freshmen and the upperclassmen perceived the high ethos source in the same light.[53] Cathcart found that education, speech training, and subject matter competence had no effect on persuasibility.[54] The discovery by Aveling and Hargreaves of great differences in suggestibility on a number of perceptual and psychomotor tasks leads to speculation that two sharply divided groups, the suggestible and the contrasuggestible, may exist. They found no tendency, however, for suggestibility to correlate with any of a number of psychometric variables.[55]

Marple found that high school and college students shift more than do adults.[56]

A single study has illustrated the possibility of investigating the effects of audience size upon the relationship between ethos and attitude change. Knower compared the effect of delivering a speech in an audience situation with giving the speech to one auditor at a time. The speech in the individual situation was somewhat more effective, women were more influenced than men, and women speakers obtained greater attitude shifts than did men. In the audience situation, however, male speakers obtained greater shifts than did women.[57]

Most of the studies described above deal primarily with the immediate effects of prestige, credibility, and other ethical elements. Hovland and his associates, however, have investigated the temporal effects of the source upon persuasion. In one of these experiments Hovland and Weiss held all of the message elements constant except for factors which produced an impression of high credibility for one source and low credibility for another. The subjects exposed to the former stimulus shifted in significantly greater numbers on immediate posttests of attitude than did those receiving the message with low credibility. Over a

[50] *Loc. cit.*

[51] Robert Cathcart, "An Experimental Study of the Relative Effectiveness of Four Methods of Presenting Evidence," *SM*, XXII (1955), 227–233.

[52] *Loc. cit.*

[53] *Loc. cit.*

[54] *Loc. cit.*

[55] *Loc. cit.*

[56] *Loc. cit.*

[57] Franklin Knower, "Experimental Studies of Changes in Attitudes: I. A Study of the Effect of Oral Argument on Changes in Attitude," *Journal of Social Psychology*, VI (1935), 315–347.

period of one month the favorable effect, however, decreased, and the subjects exposed to the "inferior" source moved toward agreement with the attitudes expressed in it. Hovland postulated a "sleeper effect"—that in the absence of further stimuli agreement with high credibility sources decays while agreement with low credibility sources grows. The possible explanation is that the subject forgets the source but retains the information and the essential arguments.[58] In a specific test of the sleeper hypothesis, Kelman and Hovland found that a high ethos source, who was rated significantly fairer, better qualified to speak, and of sounder judgment than a supposedly low ethos source, produced significantly greater attitude shifts. Over a three-week period, however, the extent to which subjects agreed with the positive source decreased significantly, and the extent to which they agreed with the negative source increased nonsignificantly. Reinforcing the recall of the sources by playing back the introductions of the tape-recorded messages produced greater agreement with the high prestige speaker and less agreement with the one of low ethos in an experimental group than occurred in a control group which received no repetition of the stimuli.[59]

In a variation of the above approach Weiss determined that a group exposed to a low credibility source showed less regression toward its original attitude than did a group exposed to a high credibility source.[60]

Also supporting the sleeper effect is the finding that over a period of time those who originally disliked a communicator became slightly more positive toward him while those who had originally liked him became slightly less favorable (nonsignificant).[61] The results of Duncker's study of the effect of prestige suggestion upon children's food preferences also confirm the Hovland sleeper effect findings in respect to both the decline of the effect over time and the renewal of strength following reinstatement.[62]

STUDIES ASSUMING THAT ETHOS IS VARIABLE

Diverse as the studies discussed above appear to be, they share a common model of ethos—that is, they are all based on the assumption that the speaker's image is relatively fixed throughout the period of communication. In sharp contrast with this view is the ethical model based on a congruity principle enunciated by Osgood.[63] Intended to explain many psychological functions, the con-

[58] Carl Hovland and Walter Weiss, "The Influence of Source Credibility on Communication Effectiveness," *Public Opinion Quarterly*, XVI (1961), 635–650.

[59] *Loc. cit.*

[60] *Loc. cit.*

[61] Arthur Cohen, "Need for Cognition and Order of Communication as Determinants of Opinion Change" in *Order of Presentation*, eds. Carl I. Hovland et al. (New Haven: Yale University Press, 1957), pp. 79–97.

[62] *Loc. cit.*

[63] Osgood, Suci, and Tannenbaum, *loc. cit.*; Charles Osgood and Percy Tannenbaum, "The Principle of Congruity in the Prediction of Attitude Change," *Psychological Review*, LXII (1955), 42–55.

gruity principle holds that an image (or meaning) depends upon the other con-
cepts with which it is associated and thus is subject to perpetual change. Among
the factors causing these variations are the successive parts of the message.

Drawing upon this generalized congruity hypothesis, Tannenbaum formu-
lated predictions of attitude change toward communication sources and then
compared these estimates with the results obtained when college students were ex-
posed to written messages. Since the correlation was .91, the conclusion is that
attitude changes of the college students in this experiment conformed to the con-
gruity hypothesis.[64]

A study of the same hypothesis applied to public speakers showed that the
congruity model predicted changes in attitude somewhat better than chance
alone.[65] This study, however, failed to produce the goodness of fit observed in
the Tannenbaum experiment.[66]

Bettinghaus hypothesized that the difference between these results was
caused by the presence of a greater number of elements in the cognitive structure
for oral than for written messages. Extending the congruity model to four ele-
ments—speaker, central proposition, speech composition, and delivery—he ob-
tained results which fit his extended model significantly better than they do the
two-element model (speaker and central proposition) employed in the earlier
experiments.[67]

GENERATING OR CHANGING ETHOS

Unlike the studies discussed in the preceding section, which typically attempted
to assess the utility of a presumed or measured ethos, the experiments discussed
below are concerned with the means of generating or altering a receiver's image
of a communicator. These efforts, in general, fall into two categories: those
which tried to establish extrinsic ethos by techniques employed before the mes-
sage itself began, and those which attempted to create intrinsic ethos by tech-
niques employed by the speaker during the presentation.[68]

[64] Percy Tannenbaum, "Initial Attitude Toward Source and Concept as Factors in
Attitude Change Through Communication," *Public Opinion Quarterly*, XX (1956), 413–425.

[65] David Berlo and Halbert Gulley, "Some Determinants of the Effect of Oral Com-
munication in Producing Attitude Change and Learning," *SM*, XXIV (1957), 10–20.

[66] Compare the results of Berlo and Gulley with those of Osgood, Suci, and Tannen-
baum, p. 212.

[67] *Loc. cit.*

[68] Extrinsic ethos is the image of the speaker as it exists prior to a given speech.
Intrinsic ethos, comparable to Aristotle's artistic ethos, is the image derived from elements
during the presentation of the speech, consciously or unconsciously provided by the speaker.
In real life speech situations, the final ethos is a product of the interaction of extrinsic and
intrinsic ethos.

EXTRINSIC ETHOS

The following experiments deal with the generation or the modification of a communicator's image by stimuli which are not part of the actual presentation.

Since the ethos of the individual depends in part upon the reputation of the group to which he belongs, experiments concerning the alteration of group images are relevant to the concept of ethos. One such experiment showed that very short speeches produced immediate attitude changes in favor of either China or Japan but that over a five-month period significant regression occurred toward the original attitudes.[69] In a similar experiment Roman Catholic school children were found to be quite persuasible to some but not all items in propaganda covering a wide range of topics. Other conclusions were that attitudes toward well-known individuals seemed about as subject to change as other attitudes and that reactions toward groups outside the students' immediate experience seemed especially subject to the influence of propaganda.[70]

Closely related to the question of changing attitudes toward individuals is that of building an image. Annis and Meier set out to create an image of an unknown source through planted editorials which linked the source with certain opinions and actions. The experimenters assumed that they could predict whether the subjects of the experiment favored or opposed these opinions and actions. As few as seven planted editorials generated the desired image, and most of the effects persisted over a period of four months.[71]

Berlo and Kumata studied the effect of a dramatic allegory, "The Investigator," in modifying images. Attitudes toward Joseph McCarthy, the subject of the satire, tended to become more favorable, while attitudes toward the source (the Canadian Broadcasting Company) and toward Congressional committees became significantly less favorable. The experimenters felt that the extreme one-sidedness of the presentation may have caused these "boomerang" effects.[72]

Using a single tape-recorded speech, Kersten compared two introductions, one of which employed techniques estimated by experts to focus attention on the speaker and his subject and to build the speaker's prestige and the other of which did not. The persons hearing the speech with the favorable introduction changed opinion significantly more than did those who heard no introduction or the poor one.[73] The confounding involved in the simultaneous manipulation of

[69] William Chen, "The Influence of Oral Propaganda Material upon Students' Attitudes," *Archives of Psychology*, XXIII (1933); "Retention of the Effect of Oral Propaganda," *Journal of Social Psychology*, VII (1936), 479–483.

[70] Wegrocki, *loc. cit.*

[71] Albert Annis and Norman Meier, "The Induction of Opinion Through Suggestion by Means of 'Planted Content,'" *Journal of Social Psychology*, V (1934), 65–81.

[72] David Berlo and Hideya Kumata, "The Investigator: The Impact of a Satirical Radio Drama," *Journalism Quarterly*, XXXIII (1956), 287–298.

[73] *Loc. cit.*

prestige and attention-focussing elements makes it impossible to conclude that the enhanced prestige of the speaker was the source of the observed difference. Indeed, Pross found that an introduction stressing the character, the reputation, and the intelligence of the speaker added little to the persuasiveness of either "ethical" or "nonethical" forms of a speech.[74]

Neither Kersten nor Pross actually measured differences in ethos; they assumed that different introductions would affect the variable. The same is true of Highlander's experiment, which seems to show that variable levels of authoritativeness of the speakers do not affect either the likeableness of radio programs or the amount of information gained from them.[75] In all such studies it is possible that the experimental treatments failed to take effect in the supposed manner.

Andersen constructed three introductions designed to establish varying levels of prestige and authoritativeness for speakers dealing with the farm problem. His conclusions were these: (1) Students perceived significant differences between a college student and a Professor of Agriculture or a Farm Extension Agent on two scales: (a) the evaluative and the dynamism dimensions of a semantic differential designed to measure ethos; (b) authoritativeness as estimated by a Likert-type scale. (2) The expected differences between the professor and the extension agent did not result except on the authoritativeness scale. (3) The more rhetorically sophisticated students seemed to perceive differences in ethos that the rhetorically naive students did not. (4) There was no proof that the variations in ethos and authoritativeness affected persuasiveness.[76]

A speech of introduction, one should note, creates special theoretical problems; for if the audience image of the introducer is low, this attitude through transfer may affect the ethos of the speaker. For instance, at the time of this writing, a laudatory introduction of a political candidate in the United States performed by James Hoffa or Fidel Castro might prove a serious detriment to persuasiveness. Since less obvious factors may also affect the experimental situation, it is conceivable that ethos may be more sensitive to such unforeseen and uncontrolled variables than it is to the verbal content of the introductions.

INTRINSIC ETHOS [77]

That changes in ethos result from hearing speeches seems clear from a study of the effect of a campaign speech by Thomas E. Dewey. Comparing ratings obtained before a speech with those recorded immediately afterwards, Thompson found that students raised their estimation of Dewey as a public speaker but did

[74] *Loc. cit.*

[75] *Loc. cit.*

[76] Kenneth E. Andersen, "An Experimental Study of the Interaction of Artistic and Non-artistic Ethos in Persuasion," unpubl. diss. (Wisconsin, 1961).

[77] *Intrinsic ethos* is defined in this study as the image of the speaker which is generated during the presentation of the message.

not change their opinions significantly concerning the soundness of his ideas and his acceptability as a candidate.[78]

Studies which have altered the presentational elements may be divided into those which have manipulated characteristics of the manuscript and those which have altered such nonmanuscript stimuli as the speaker's appearance or his style of delivery.

A common type of study is the comparison of the effect of presenting both sides with the effect of giving but one—a distinction which seems to the writers to be ethically significant.[79] In one such investigation Hovland, Lumsdaine, and Sheffield found (1) that the "both sides" presentation was significantly more effective for subjects with a high school education when the weight of evidence clearly supported one side; and (2) that a one-sided presentation was more effective with subjects initially favoring the advocated view and with subjects who had not completed high school.[80]

Similarly, Paulson's experiment involved two speeches, one of which omitted opposing arguments and the other of which made the barest mention of them. Opinion changes did not differ significantly, but the "both sides" speech was significantly superior in respect to the amount of information which was obtained.[81] Shanck and Goodman also tested reactions to propaganda which presented equal amounts of argument on both sides or one-sided pro or con arguments. That no significant difference was observed,[82] might be explained by the extreme subtlety of the propaganda.

Another rhetorical element which is sometimes held to carry ethical implications is the use of authority and citations of source. Three studies described earlier in this paper reported that the inclusion of authority did not increase persuasiveness.[83] Cathcart presented four versions of a speech with variations from form to form in respect to the amount of specific evidence and documentation. He found that the forms which supported but did not document contentions and which supported, documented, and specified that the sources cited were experts

[78] Wayne Thompson, "A Study of the Attitude of College Students Toward Thomas E. Dewey Before and after Hearing Him Speak," *SM*, XVI (1949), 125–134.

[79] The presentation of both sides of an issue is often treated as one aspect of ethical proof. The practice also has logical connotations. It is possible to consider the impact of the treatment of both sides on the image of the speaker and the impact of this image on persuasiveness as distinct from the logical value of the treatment and the resultant persuasiveness.

[80] Carl Hovland, Arthur Lumsdaine, and Fred Sheffield, *Experiments on Mass Communication:* Vol. III of *Studies in Social Psychology in World War II* (Princeton: Princeton University Press, 1949).

[81] *Loc. cit.*

[82] R. C. Shanck and Charles Goodman, "Reactions to Propaganda on Both Sides of a Controversial Issue," *Public Opinion Quarterly*, III (1939), 107–112.

[83] See the studies previously cited by Sikkink, by Cole, and by Gilkinson, Paulson, and Sikkink.

produced significantly greater shifts at the five per cent level than did the form which merely supplied generalizations. A fourth form which supported the assertions and documented fully but did not say that the cited sources were experts was not significantly more effective than the one which merely supplied generalizations.[84] That such differences as were observed were attributable to nonethical considerations is suggested by the finding that none of the speeches differed in terms of the audience's evaluations of the speaker's competence, enthusiasm, or clarity of ideas.[85]

Ludlum constructed a speech in which he incorporated several elements designed to increase the credibility of the source. His techniques include the acknowledgment of opposing arguments, "leading thoughts rather than forcing," showing alleged facts to be consistent with known facts, showing material to be recent, and manifesting a "high degree of credibility" by means of self-praising statements. Comparing the persuasiveness of this speech with that of a "straight argumentative" address, he found the latter to be more effective.[86] Since he did not measure received ethos, the effect of the variables in the nonargumentative speech is unknown. Moreover, since all of the variables were incorporated in a single speech, it is impossible to isolate the effect of any one of them. If some of the techniques produced positive effects and others acted negatively, the effects may have counterbalanced one another. Thirdly, some of the self-praising statements in the nonargumentative speech may have had an effect quite different from that intended. Finally, argumentative technique may have an ethical dimension for college students, such as those whom Ludlum employed, with the result that the argumentative talk may well have produced a more favorable speaker image than did the speech employing an assortment of "conciliatory" techniques.

The experiment by Ludlum points up the importance of specifying carefully any differences in content between speeches intended to produce high credibility and those against which their effects are to be compared. This same consideration applies to an early experiment by Pross, who constructed four forms of a speech on a single topic. Two of these employed techniques of "ethical appeal" (as judged by speech experts) and the other two did not. Length was kept constant.[87] The interpretation of Pross' nonsignificant findings is difficult, for matching the lengths necessitated the removal of material in order to make room for the ethical elements. As a consequence the two ethical speeches had almost no logical structure.

[84] *Loc. cit.*

[85] The problem of separating the logical and the ethical effects of the same complex stimulus is again at issue. The writers believe that a complex stimulus may affect both logical and ethical proof and perhaps pathetic proof as well.

[86] Thomas Ludlum, "A Study of Techniques for Influencing the Credibility of a Communication," unpubl. diss. (Ohio State, 1956).

[87] *Loc. cit.*

This investigation and other studies indicate a confusion in the use of the terms *ethos* and *ethical*. On the one hand, these terms are used to refer to the audience's image of the speaker, as when it is said that Parran is more credible or higher in ethos than is Dennis; on the other hand, certain types of speech content are labeled *ethical appeals*. For example, a speech which employs many self-references and conciliatory elements is described as higher in ethos content than an address which follows a straightforward proposition-and-proof format. Usually, when rhetoricians classify a speech content element as "ethical," they seem to mean that the elements *seem to the classifier* to be calculated to gain the good will of the audience or to enhance the speaker's ethos. In our present state of knowledge concerning audience response, such a judgment is at best only an educated guess. Therefore, when the results of the Pross and the Ludlum studies are cited in support of the proposition that ethical speeches are no more effective in inducing attitude change than are logical speeches, it should be specified very carefully that the results are based upon analysis of speech content and not upon the image of the speaker which the audience holds. The present writers as rhetorical critics believe that some of the Pross and Ludlum "ethical" speech techniques probably had decidedly negative effects on the ethos of the speaker. The basis of this judgment, of course, is intuitive, not empirical.

The message which an audience receives during a speech obviously involves more than verbal (manuscript) stimuli. Several studies indicate that nonverbal factors produce audience judgments concerning the speaker. Haiman found (1) that an audience rated a graduate male speaker higher in competence than it did an undergraduate male and two females; (2) that with content held constant, graduate speakers obtained higher rates of fairmindedness, sincerity, and likeableness than did undergraduates; (3) that in two experiments shifts of opinion within the audience were correlated positively with the speaker's competence ratings and with nothing else; and (4) that although variations in ratings of likeableness and physical attractiveness could be produced through changes in appearance and demeanor, significant changes in attitude did not result.[88]

Many of the variables in the Haiman study are those associated with differences in social status. Harms has shown that, regardless of their own position, listeners in general assign high credibility to speakers of high social status and low credibility to those of low status. Such judgments occur even though the stimulus is nothing more than a short tape-recorded sample of speech. The Harms study further shows that listeners can discriminate class differences with rough accuracy and that they identify the low status speakers somewhat more readily than they do those of superior background.[89]

Consistent with these results is the experimental finding that audiences may construct relatively complete assessments of a speaker's personality and physical

[88] *Loc. cit.*
[89] *Loc. cit.*

characteristics on the basis of his voice. Other conclusions to this study were that personality, physical characteristics and occupation were likely to be perceived correctly, that consistency of response (right or wrong!) was a stronger tendency than accuracy of judgment, and that gross psychological characteristics were judged more accurately than physical features.[90]

These findings suggest the plausibility of the "truth-will-out" theory regarding the action of subliminal, nonverbal stimuli upon the ethos of the speaker. As the theory goes, an insincere speaker's sophistry will betray itself through unconscious behaviors which act subliminally upon the auditors. An experiment by Hildreth, however, offers no confirmation for this hypothesis. Defining sincerity in terms of the speaker's expressed preference for one side of a controversial issue and using a large number of speakers who filmed speeches on both their preferred and their nonpreferred sides, he discovered that audiences were unable to distinguish the sincere from the insincere speeches and that the ratings of the two types of speeches did not differ significantly in effectiveness. Rather, ratings of effectiveness and of *estimated* sincerity were positively correlated.[91] Unfortunately, methodological considerations render the results of the experiment inconclusive. Since the "sincere" speech was composed, practiced, and delivered first in all instances, the time allowed for composition was very brief, and the making of a film was presumably unfamiliar to a majority of the speakers, a number of factors were operating to enhance performance in the "insincere" presentation as contrasted with the "sincere" one.

Indeed, the role which subliminal perception may play in the establishment of ethos has been little clarified by experiments. Drawing upon the "hidden persuader" approach, Steiner found that placing visually superimposed words on a screen at subliminal intensity levels did not alter either the effectiveness of a filmed speech or the judgment of the sincerity of the speaker.[92]

Combining prior and intrinsic elements, Strother attempted to study a combination of factors. The addition of ethical techniques either singly or in combination did not significantly increase the persuasiveness of a low ethos source. However, as measured by a hostility scale, the combination of elements apparently surpassed a control speech in allaying hostility toward the low ethos source. In the control presentation neither conciliatory nor special introductory techniques were employed.[93]

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[90] Gordon Allport and Hadley Cantril, "Judging Personality from Voice," *Journal of Social Psychology*, V (1934), 37–55; also in Hadley Cantril and Gordon Allport, *The Psychology of Radio* (New York: Harper and Row, 1935).

[91] Richard Hildreth, "An Experimental Study of Audiences' Ability to Distinguish Between Sincere and Insincere Speakers," unpubl. diss. (Southern California, 1953).

[92] George Edward Steiner, "An Experimental Study of the Influence of Subliminal Cue Words on an Audience's Perception of a Filmed Speaker's Sincerity, Effectiveness, and Subject Matter," unpubl. diss. (Southern California, 1959); *SM*, XXVII (1960), 93–94.

[93] *Loc. cit.*

In another investigation of combinations of variables Andersen used two tape-recorded speeches, both of which were attributed to three sources described in tape-recorded introductions. The principal results were these: (1) Despite great manuscript variations which speech experts predicted would produce different levels of ethos, the only significant differences between the two speeches were those measured on a dynamism scale. (2) The elements of artistic and inartistic ethos did interact significantly in producing the final image of the speaker. (3) The variations in ethos did not cause a significant difference in persuasiveness.[94]

MEASUREMENTS OF ETHOS AND ATTEMPTS TO ASSESS THE RELATIVE DEGREES OF ETHOS

In a few instances the development of a measure of ethos has been the main goal of a research project, but more often the measurement of prestige, credibility, or some other ethical component has been ancillary to the study of such presumed results of ethos as preferences, attitude change, and information gain. The methods of measurement in both types of investigation are the same: (1) rankings, (2) sociograms, (3) "prestige indexes" obtained from attitude change data, (4) linear rating scales, (5) Thurstone-type attitude scales, and (6) devices similar to Likert scaling techniques, including the semantic differential.

Perhaps the most elementary method of determining differences among sources in respect to prestige, credibility, likeableness, etc., is to require subjects to arrange the sources in rank order. Sherif, for example, presented a list of sixteen authors to a group of undergraduates and asked them to rank the authors according to personal preferences for their writings. A month later the subjects were told to rank sixteen passages in respect to literary merit. Since all of the passages had been written by a single author not included in the list and since literary experts had judged all of them to be of equal merit, the only variable was the false attachment of a different author's name to each excerpt. Correlations between the two sets of ranks were held to represent the effects of "prestige." The replication of the study with similar results in three instances indicates the usefulness of the rank-order technique for simple experiments of this type.[95] The method was to determine the rank order for individuals, to compute rank correlations for individuals, and to draw conclusions from the average correlations. While this technique seems justified, the rank-order method employed by Michael, Rosenthal, and DeCamp was not. In an effort to discredit the "constant stimulus" theory of prestige, these authors worked with mean and median ranks [96]—statistics which are generally meaningless.

Cole demonstrated the possibility of using sociometric data for the determi-

94 *Loc. cit.*
95 *Loc. cit.*
96 *Loc. cit.*

nation of certain characteristics of ethos. Using a particular personal characteristic (judgment, personal appeal, etc.) as the basis for sociometric choices, he selected one or more members of a group as "stars" and then assumed that they were more highly regarded than their colleagues. Under some conditions, these preferred members were as persuasive as authorities from outside the group.[97]

Kulp apparently made the first attempt to develop an index of prestige based upon attitude change. In a classic design which was to be repeated with variations many times during the ensuing years, he first administered Harper's test of liberalism to more than three hundred graduate students at Columbia. Later, various subgroups were told that the responses supplied them had been written by social scientists, educators, and other learned persons. The relative amounts of attitude shift toward each of these sources was used as the basis for computing a prestige index for each of the several professional groups.[98] Bowden, Caldwell, and West replicated the essential features of Kulp's study in an experiment using junior high, high school, and college students as subjects and employing a variety of different prestige levels. Sample findings with respect to the economic problems considered were these: "Prestige of the educators seems to increase as progress is made up the educational ladder" and "Ministers received the lowest rank in every case." [99]

Underlying these measuring techniques is the assumption that the prestige of a source is directly proportional to the ability to produce attitude shift. In 1938 Lurie formalized this point of view when he defined prestige as "The change in scale value of certain items brought about by attaching the name of the symbol to these items." He obtained scale values for prestige by administering a test of attitude without attaching prestige labels to the items, by administering the same test two weeks later with prestige labels attached, and by then subtracting the scores on the first test from those on the second. The remainder was the index of prestige.[100]

Naturally, prestige measures obtained in this manner are not pure or independent measures of the variable. Moreover, to use any of these measures to test the hypothesis that prestige induces attitude change is impossible, for the measure of prestige *is* attitude change. In an effort to develop an independent index suitable for testing this hypothesis, Saadi and Farnsworth combined gross ratings of "like," "indifferent," and "dislike" by the formula $100 \ [(L + \frac{1}{2}I) (L + I + D)]$ to obtain a score for likeableness based on group data.[101]

[97] *Loc. cit.*

[98] Daniel Kulp, II, "Prestige, as Measured by Single-Experience Changes and Their Permanency," *Journal of Educational Research*, XXVII (1934), 663–672.

[99] A. O. Bowden, Floyd Caldwell, and Guy West, "A Study in Prestige," *American Journal of Sociology*, XL (1934), 193–203.

[100] Walter Lurie, "The Measurement of Prestige and Prestige-Suggestibility," *Journal of Social Psychology*, IX (1938), 219–225.

[101] *Loc. cit.*

The multiple-choice aspect of the Saadi-Farnsworth measure was an early precursor of an obvious means of measuring various aspects of ethos—the rating scale. An early experimenter with this type of measurement was Lorge, whose subjects rated seventy sources on a five-interval scale ranging from "those individuals whose opinions you respect most" to "those individuals for whose opinions you have least respect." [102] More recently, Hovland and Weiss employed a five-point linear scale of "trustworthiness" to evaluate the credibility of two sources.[103]

The well-known study by Haiman used a variety of scales. In one phase of his experiment two nationally prominent public figures were evaluated on nine-point scales of reputation and competence. In other parts of the investigation student speakers were rated on similar scales for the qualities of sincerity, fairmindedness, physical appearance, conceit, competence, and likeableness.[104]

In addition to being one of the first experimental research workers to recognize explicitly the multidimensionality of ethos, Walter made the earliest effort to apply recognized test construction methods to the problem of creating a measuring device. His specific project was the development of an instrument to measure a single factor, the evaluation of character. Beginning with nearly 400 character-describing statements and employing both the Thurstone sorting techniques and the Seashore rating methods, he developed two tests of twenty-two items each. When applied to such individuals as Franklin Roosevelt and "The person with the best character I have known," the two forms of the test were normally distributed, distinguished among intuitively perceived gross character levels, and correlated well (.86) with each other. Applied to two speakers in the classroom, the two forms correlated extremely well (.96).[105]

The Osgood and Stagner use of bipolar nouns in a set of scales to rate occupations and occupational groups was a forerunner of the semantic differential technique. They found that the prestige of jobs and workers could be determined through the use of their scales.[106]

Although Walter asserted the multidimensionality of ethos and although Haiman's technique actually employed a polydimensional approach, until recently no practical way of employing multivariate measures of ethos in research seemed to exist. Now the semantic differential technique makes such research possible. Berlo and Gulley,[107] Berlo and Kumata,[108] and Bettinghaus [109] used

[102] *Loc. cit.*

[103] *Loc. cit.*

[104] *Loc. cit.*

[105] Otis Walter, Jr., "The Measurement of Ethos," unpubl. diss. (Northwestern, 1948).

[106] Charles Osgood and Ross Stagner, "Analysis of a Prestige Frame of Reference by a Gradient Technique," *Journal of Applied Psychology*, XXV (1941), 275–290.

[107] *Loc. cit.*

[108] *Loc. cit.*

[109] *Loc. cit.*

the differential to measure attitude toward the communicator, but in each instance they reported only one dimension of the semantic space, the evaluative aspect of the image. "Although it does not tap much of the *content* of an attitude in a denotative sense . . . it does seem to provide an index to the location of the attitude object along a general evaluative continuum." [110] Employed in this manner, the semantic differential is similar in many ways to a traditional Likert scale in which a number of judgments concerning the concept are rendered on a linear scale and the sum of the scale values recorded by the subjects is used as a more-or-less unidimensional measure of the single property with which the scale is concerned.

Andersen developed a semantic differential which was specifically designed to measure ethos. Employing terms garnered from theoretical and experimental literature and securing responses to famous living people from freshmen engineering and physical education students, he obtained two major dimensions (evaluative and dynamism) in the images.[111] Berlo carried out a similar study, but he used a greater number of concepts and more students than did Andersen. Berlo also employed an oblique solution, whereas Andersen's method was the orthogonal factor solution.[112] Inspection suggests that the two structures were not essentially dissimilar if allowance is made for the difference in the factor rotation methods.

SUMMARY

Despite the great number of experimental studies relevant to ethos, the scope of this concept is such that the findings are not yet sufficiently numerous and sophisticated to permit definitive conclusions about the operation of ethical proof.

The finding is almost universal that the ethos of the source is related in some way to the impact of the message. This generalization applies not only to political, social, religious, and economic issues but also to matters of aesthetic judgment and personal taste. Some evidence even shows that "prestige-suggestion" can affect the appetite for certain foods and can influence performances of perceptual and psychomotor tasks. On the other hand, there is not enough evidence to suggest that the amount of information gained from exposure to a message is related to the ethos of the source—at least this lack of relationship seems to be true of college populations. The effect of ethos, again according to many studies, has a temporal dimension. In other words, when the stimulus is not renewed, material presented by a high ethos source loses in persuasiveness and that

[110] Osgood, Suci, and Tannenbaum, p. 195.

[111] *Loc. cit.*

[112] David K. Berlo, "An Empirical Test of a General Construct of Credibility," unpubl. paper presented at the SAA convention, New York City, December 29, 1961.

given by a poor source gains. Recall of the source reestablishes some of the initial effect, but the improvement which renewal produces decays more rapidly than does the original increment.

Some auditors appear to be more susceptible to ethical appeal than others; some may be contrasuggestible. However, there is no evidence to show that suggestibility to prestige correlates well with intelligence, education, speech training, subject-matter competence, age, or sex. The only variable which seems clearly related to differences in suggestibility to prestige is the initial attitude toward the topic or the purpose: consistently, those who are neutral initially shift more often than do those who are at one extreme or the other.

Research shows that expert opinion may be about as influential as majority opinion in inducing attitude change.

While most experimentation has been conducted in a fixed ethos model, recent research shows that a congruity model can be used to predict attitude change toward both a communicator and his topic. Incorporating elements concerning speech composition and delivery increased the usefulness of the model.

Printed and oral propaganda can succeed in creating and altering images of groups or of individuals, but attempts to produce unfavorable reactions to individuals may backfire. When this response occurs, the prestige of the criticized person may increase and that of the attacker may decline.

Speeches of introduction probably influence the image of a speaker, but most of the evidence on this point is indirect.

Certain characteristics of speech affect the ethos of the speaker. No evidence, however, supports the common beliefs (1) that giving "both sides" is a superior way to present controversial material, (2) that citing the sources of evidence increases persuasiveness, and (3) that including conciliatory remarks, statements of self-praise, and other conscious, obvious attempts at ethical appeal enhances the speaker's status.

Such noncontent stimuli as dress, voice, and manner apparently affect the attitude of the audience toward the speaker, but these factors may not be related to persuasiveness on a given occasion. There is no evidence that the audience can perceive lack of sincerity; rather, audiences appear to react to their evaluations of the competence of the speaker.

Many techniques of measurement have been applied to ethos: among these are ranking, sociograms, prestige indexes, linear rating scales, Thurstone scales, and the semantic differential. Each of these has proved useful in assessing one or more of the aspects of ethos.

This preceding body of findings suggests certain possibilities for future research:

1. The dimensions of ethos should be explored through multivariate analysis in terms of different auditors, different speakers, and different speech situations.

New measurement techniques, and especially the semantic differential, make this type of research possible.

2. Ethos or ethical proof should be measured in experiments designed so that this variable is not confounded with persuasiveness.

3. The effect upon ethos of the interaction of prior reputation and the artistic elements in the message should be studied. Findings in this area would be of great importance to rhetorical theory.

4. Some research suggests that differences in ethos are not established as easily with some audiences as previous experimenters often assumed. More research dealing with the methods of establishing and modifying ethos is needed.

5. The effect of variations in auditors, situations, and topics upon the function of ethical proof in persuasion should receive renewed attention. The utilization of improved designs and measuring devices can create experimental conditions that may lead to more meaningful results than those obtained in the past.

AN OVERVIEW OF PERSUASIBILITY RESEARCH

Irving L. Janis and Carl I. Hovland

Theorists and research investigators in many different areas of human behavior—attitude change, group dynamics, psychotherapy, hypnosis, and social perception—share a common interest in understanding the *predispositional* factors which underlie responsiveness to one or another form of social influence. While these researchers have approached the study of predispositional factors from widely different points of emphasis, many of their findings converge on a few basic variables which have been designated as "persuasibility factors."

Several studies of personality factors in relation to individual differences in persuasibility were reported by Hovland, Janis, and Kelley in 1953. Since that time further studies have been conducted to provide a more systematic analysis of the personality correlates of persuasibility and also of the course of its development from childhood through adolescence. . . .

DEFINITION OF PERSUASIBILITY

By "persuasibility factor" is meant any variable attribute within a population with *consistent individual differences* in responsiveness to one or more classes of influential communications. The meaning of the key terms in this definition will become somewhat clearer if we consider a brief schematic analysis of the communication process involved in successful persuasion.

Whenever an individual is influenced to change his beliefs, decisions, or general attitudes, certain identifiable external events occur which constitute the *communication stimuli*, and certain changes in the behavior of the person take place which constitute the *communication effects*. Communication stimuli include not only what is said, but also all of the intentional and unintentional cues which influence a member of the audience, including information as to who is saying it, why he is saying it, and how other people are reacting to it.

The observable communication effects could be said to subsume all perceptible changes in the recipient's verbal and nonverbal behavior, including not only changes in private opinions or judgments but also a variety of learning effects (e.g. increased knowledge about the communicator's position) and superficial conformist behavior (e.g. public expression of agreement with the conclusion despite private rejection of it). However, our main interest centers upon those changes in observable behavior which are regarded as components of "genuine" changes in opinions or in verbalizable attitudes. This requires observational methods which enable us to discern, in addition to the individual's public responses, those indications of his private thoughts, feelings, and evaluations that are used to judge whether the recipient has "internalized" the communicator's message or is merely giving what he considers to be a socially acceptable response.

We use the term "attitude change" when there are clear-cut indications that the recipient has internalized a valuational message, as evidenced by the fact that the person's perceptions, affects, and overt actions, as well as his verbalized judgments, are discernibly changed. When there is evidence of a genuine change in a *verbalized belief or value judgment*, we use the term "opinion change," which usually constitutes one component of attitude change. Almost all experiments on the effects of persuasive communications . . . have been limited to investigating changes in opinion. The reason, of course, is that such changes can readily be assessed in a highly reliable way, whereas other components of verbalizable attitudes, although of considerable theoretical interest, are much more difficult to measure.

Neither "opinion change" nor "attitude change" is used to refer to those instances of surface conformity in which the person *pretends* to adopt a point of

view that he does not really believe. Thus, the area of opinion change with which we are concerned includes studies dealing with what has been referred to as "internalization" and "identification," but excludes those dealing with "compliance" (cf. Kelman, 1959).

Figure 1 gives a schematic outline of the major factors that enter into attitude change. The observable communication stimuli and the observable effects are represented as the two end-points of the communication process. These are the antecedent and consequent events that are observable; they constitute the empirical anchorage for two main types of constructs which are needed in order to account for the interrelationships between the communication stimuli and observable effects: *predispositional factors* and *internal mediating processes*. Predispositional factors are used to account for *individual differences in observable effects when all communication stimuli are held constant*. Constructs referring to internal, or mediating, processes are used in order to account for the differential effects of different stimuli on a given person or group of persons. In other words, internal-processes constructs have been formulated primarily to account for the different effects attributable to *different types of communications* acting on the *same people*; whereas, predispositional constructs are needed to account for the different effects observed in *different people* who have been exposed to the *same communications*.

Hovland, Janis, and Kelley (1953) have reviewed and analyzed the experimental evidence on the effects of low vs. high credibility sources, strong vs. weak fear-arousing appeals, one-sided vs. two-sided presentation of arguments, and other such variations in communication stimuli. From such studies it has been possible to formulate a number of generalizations concerning the conditions under which the probability of opinion change will be increased or decreased for the *average* person or for the *large majority* of persons in any audience. Such propositions form the basis for inferences concerning the mediating processes responsible for the differential effectiveness of different communication stimuli.

Mediating processes can be classified in terms of three aspects of responsiveness to verbal messages (see Hovland, Lumsdaine, and Sheffield, 1949; and Hovland, Janis, and Kelley, 1953). The first set of mediating responses includes those which arouse the *attention* of the recipient to the verbal content of the communication. The second set involves *comprehension* or decoding of verbal stimuli, including concept formation and the perceptual processes that determine the meaning the message will have for the respondent. Attention and comprehension determine what the recipient will *learn* concerning the content of the communicator's message; other processes, involving changes in motivation, are assumed to determine whether or not he will accept or adopt what he learns. Thus, there is a third set of mediating responses, referred to as *acceptance*. Much less is known about this set of responses, and it has become the main focus for present-day research on opinion change. . . .

Observable communication stimuli*	Predispositional factors	Internal mediating processes	Observable communication effects

Communication situation

Communication — free (General persuasibility)

Attitude change

Opinion change

Content characteristics:
Topic — content of the conclusions
Appeals
Arguments
Stylistic features

Communicator-bound

Content-bound:
Topic-bound
Appeal-bound
Argument-bound
Style-bound

Attention

Perception change

Communicator characteristics:
Role
Affiliations
Intentions

Communication-bound

Comprehension

Affect change

Media characteristics:
Direct vs. indirect interaction
Sense modality

Media-bound

Acceptance

Action change

Situational surroundings:
Social setting
Extraneous noxious stimuli
Extraneous pleasant stimuli

Situation-bound

FIGURE 1. Major Factors in Attitude Change Produced by Means of Social Communication.
* The categories and subcategories are not necessarily exhaustive, but are intended to highlight the main types of stimulus variables that play a role in producing changes in verbalizable attitudes.

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Two major classes of predispositions can be distinguished. One type, called "topic-bound," includes all of those factors which affect a person's readiness to accept or reject a given point of view on a particular topic. The other main type, called "topic-free," is relatively independent of the subject matter of the communication. In the discussion which follows, we shall first make some comments about the nature of topic-bound predispositions and about the more general class of "content-bound" factors, including those referred to as "appeal-bound," "argument-bound," and "style-bound." Then we shall attempt to extend the analysis of predispositional factors by making further distinctions, calling attention to a number of content-free factors that are nevertheless bound to other properties of the communication stimuli. These various types of "communication-bound" factors will be contrasted with the unbound or "communication-free" factors to which our research efforts . . . have primarily been directed.

TOPIC-BOUND PREDISPOSITIONS

Topic-bound factors have been extensively studied by social psychologists and sociologists over the past twenty-five years, and many propositions have been investigated concerning the motives, value structures, group affiliations, and ideological commitments which predispose a person to accept a pro or con attitude on various issues. The well-known studies of authoritarian personalities by Adorno, Else Frenkel-Brunswik, and others (1950) have provided a major impetus toward understanding attitude change on specific issues, such as racial prejudice, in relation to unconscious motives and defense mechanisms. Some findings which bear directly on topic-bound predispositions have been reported by Bettelheim and Janowitz (1950) : Anti-Semitic propaganda (in the form of two fascist pamphlets) was most likely to be approved by men who either had already acquired an intolerant ideology toward Jews or who had acquired a tolerant ideology but were insecure personalities with much undischarged hostility. Another pioneering study in this field is that of Smith, Bruner, and White (1956) ; these authors conducted a small series of intensive case studies for the purpose of determining the personality functions served by holding certain flexible and inflexible opinions about Soviet Russia and communism. Many other studies have been made concerning the personality correlates of readiness to accept favorable or unfavorable communications about specific types of ethnic, national, and political groups (Hartley, 1946; Sarnoff, 1951).

Some recent studies of topic-bound predispositions deal with relatively general factors that are not limited to the modification of attitudes toward only one type of social group. For instance, Weiss and Fine (1955, 1956) investigated the personality factors which make for high readiness to accept a message advocat-

‸⁼⁻t, punitive stand toward social deviants. The findings suggest that per-

sons who have high aggression needs combined with strong extrapunitive tendencies will be prone to adopt a strict, punitive attitude toward anyone who violates social norms. In order to test this hypothesis in its most general form, it would be necessary to use many different communications to determine whether the specified personality attributes are correlated with attitude change whenever a punitive stand is advocated toward any type of social deviant. If the hypothesis is confirmed, we shall be able to speak of a very general type of topic-bound predisposition.

This example highlights the fact that the difference between topic-bound and topic-free is not necessarily the same as the dimension of specificity-generality. Some topic-bound predispositions may be very narrowly confined to those communications expressing a favorable or unfavorable judgment toward a specific trait of a particular person (e.g. the members of an organization, after having been embarrassed by the gauche manners of their highly respected leader, would be disposed to reject only those favorable statements about him which pertain to a limited aspect of his social behavior). Other topic-bound predispositions may be extremely general (e.g. certain types of persons may be inclined to accept any comments which express optimism about the future). A topic-bound predisposition, however, is always limited to one class of communications (a narrow or a broad class) which is defined by one or another characteristic of the *content of the conclusion.*

Similar restrictions hold for some of the topic-free factors. For example, Hovland, Janis, and Kelley (1953) point out that many topic-free factors may prove to be bound to specific characteristics of the communication:

Some of the hypotheses concerning topic-free predispositions deal with factors which predict a person's responsiveness only to those persuasive communications that employ certain types of argumentation. Investigations of topic-free predispositions ultimately may reveal some that are associated primarily with the nature of the communicator, others that are associated with the social setting in which the communication takes place, and perhaps still others that are so broad in scope that they are relatively independent of any specific variables in the communication situation.

Thus, for any communication, we assume that there are likely to be several different types of personality predispositions, topic-bound and topic-free, whose joint effects determine individual differences in responsiveness. The essential point is that, by also taking account of topic-free factors, it should be possible to improve predictions concerning the degree to which members of the audience will be influenced by persuasive communications. Such factors have generally been neglected in analyses of audience predispositions [p. 176].

In the discussion which follows, we shall attempt to trace the implications of the distinction—which we now believe to be extremely important—between topic-free factors that are bound in some nontopic way and those that are completely unbound. A suggested list of bound predispositions is provided in the second column of Figure 1. We shall briefly consider those topic-free factors which

are bound to other features of the communication situation before turning to a detailed examination of the unbound, or communication-free, factors.

CONTENT-BOUND FACTORS

The content of a communication includes appeals, arguments, and various stylistic features, as well as the main theme or conclusion which defines its topic. The effectiveness of each of these content characteristics is partly dependent upon certain predispositional factors which we designate as "content-bound."

APPEAL-BOUND FACTORS.   In the content of many communications one finds appeals which explicitly promise social approval or threaten social disapproval from a given reference group (see Newcomb, 1943). Responsiveness to these social incentives partly depends upon the degree to which the person is motivated to be affiliated with the reference group (see Kelley and Volkart, 1952). Personality differences may also give rise to differences in responsiveness to special appeals concerning group consensus and related social incentives (Samelson, 1957). Different types of personalities may be expected to have different thresholds for the arousal of guilt, shame, fear, and other emotions which can be aroused by special appeals. For example, Janis and Feshbach (1954) have found that certain personality factors are related to individual differences in responsiveness to fear-arousing appeals. Experimental studies by Katz, McClintock, and Sarnoff (1956, 1957) indicate that the relative effectiveness of rational appeals, and of self-insight procedures designed to counteract social prejudices, depends partly upon whether the recipient rates low, medium, or high on various measures of ego defensiveness.

ARGUMENT-BOUND FACTORS.   Many variables have been investigated which involve stimulus differences in the arrangement of arguments and in the logical relationship between arguments and conclusions. Cohen, in Volume 1 of the present series (1957, Ch. 6), presents evidence indicating that predispositional factors play a role in determining the extent to which an individual will be affected by the order in which information is presented. Individuals with low cognitive-need scores were differentially influenced by variations in order of presentation while those with high scores were not. One would also expect that individual differences would affect the degree to which a person will be influenced by such variations as the following: (1) The use of strictly rational or logical types of argument vs. propagandistic devices of overgeneralization, innuendo, *non sequitur,* and irrelevant *ad hominem* comments. (2) Explicitly stating the conclusion that follows from a set of arguments vs. leaving the conclusion implicit. (A comparison of effects for subjects with high and low intelligence is presented in Hovland and Mandell, 1952.)

STYLE-BOUND FACTORS.   Differences in social class and educational background probably account for some of the individual differences in responsiveness to variations in style—for example, a literary style as against a "folksy" ap-

proach. Other variations in treatment that may be differentially effective are technical jargon vs. simple language; slang vs. "pure" prose; long, complex sentences vs. short, declarative sentences. Flesch (1946) and other communication researchers have presented evidence concerning individual differences in responsiveness to such stylistic features.

COMMUNICATOR-BOUND FACTORS

The effectiveness of a communication depends on the recipient's evaluation of the speaker (see, e.g., Hovland and Weiss, 1951–52). The phase of the problem which has been most extensively studied is that concerned with the authoritativeness of the communicator. That personality differences in the recipients are associated with the extent to which particular communicators are effective is clearly shown in a study by Berkowitz and Lundy (1957). Their college-student subjects who were more influenced by authority figures tended to have both higher self-confidence and stronger authoritarian tendencies (high F-scale scores) than those who were more influenced by peers.

The affiliation of the communicator is also an important factor, in interaction, of course, with the group membership of the recipient. Thus the communicator who is perceived as belonging to a group with which the recipient is also affiliated will be more effective on the average than a communicator who is perceived either as an outsider or as a member of a rival group (Kelley and Volkart, 1952; Kelley and Thibault, 1954). When, for example, a speaker's affiliation with a political, social, religious, or trade organization becomes salient to the audience, persons who are members of the same organization will be most likely to be influenced by the speaker's communication.

Finally, the intent of the communicator is perceived differently by different members of the audience, with a consequent influence on the speaker's effectiveness. A number of studies have shown that the fairness and impartiality of the communicator is viewed quite differently by individuals with varying stands on an ideological issue, and this in turn is related to the amount of opinion change effected. For a discussion of this problem see Hovland, Harvey, and Sherif (1957).

MEDIA-BOUND FACTORS

It seems probable that some persons will be more responsive to communications in situations of direct social interaction, whereas others may be more readily influenced by newspapers, magazines, radio programs, television, movies, and mass media in general. (See the discussion by Lazarsfeld, Berelson, and Gaudet, 1944, concerning the psychological differences between propaganda emanating from mass media and from informal social contacts.) Other media characteristics that may evoke differential sensitivities involve variations in the sense modalities employed: e.g. some people may be more responsive to visual than to auditory

media. There is some evidence that individuals with less education may be more influenced by aural presentations (e.g. by radio and lectures) than by printed media (see summary of studies by Klapper, 1949). However, few systematic studies have been made as yet on the relation between predispositions and media characteristics.

SITUATION-BOUND FACTORS

While no systematic studies can be cited, there are indications that some persons tend to be more influenced when socially facilitative cues accompany the presentation of a persuasive communication (e.g. presence of others, applause). The experiments by Asch (1952) and other investigators contain some indirect implications bearing on individual differences in responsiveness to an expression of consensus on the part of others in the audience. Research by Razran (1940) and an unpublished study by Janis, Kaye, and Kirschener indicate that some people are affected by the pleasantness or unpleasantness of the situation in which a communication is received. For example, the effectiveness of persuasive messages was found to be enhanced if they were expressed at a time when the subjects were eating a snack. We might expect to find some personality factors associated with low vs. high sensitivity to extraneous stimulation of this type.

Just as in the case of topic-bound factors, each of the above content-bound, communicator-bound, media-bound, and situation-bound factors may include some predispositions that are very narrow in scope (e.g. applicable only to communications which emanate from one particular communicator) and other predispositions that are broadly applicable to a large class of communications (e.g. to all communications emanating from purported authorities or experts). It is the predispositions at the latter end of the specificity-generality continuum that are of major scientific interest, since they are the ones that increase our theoretical understanding of communication processes and help to improve predictions of the degree to which different persons will be responsive to social influence.

PREDICTIVE VALUE OF UNBOUND PERSUASIBILITY FACTORS

Unbound persuasibility factors . . . involve a person's general susceptibility to many different types of persuasion and social influence. We assume that these factors operate whenever a person is exposed to a persuasive communication and that they do not depend upon the presence or absence of any given type of content or on any other specifiable feature of the communication situation. Thus unbound factors are communication-free, and this differentiates them from even the most general of the bound factors.

One long-range product of research on bound and unbound persuasibility

factors might be conceived of as a set of general formulae which could be used to predict, within a very narrow range of error, the degree to which any given person will be influenced by any given communication. The formulae would be multiple regression equations and would specify the personal attributes $(X_1, X_2, X_3, \ldots X_N)$ that need to be assessed in order to make an accurate prediction concerning responsiveness to a given class of communications (Y_A). More than one regression equation would presumably be necesary in order to take account of the major bound personality factors; i.e. certain attributes might have high weight for one type of communication (Y_A) but low or zero weight for other types $(Y_B, Y_C, Y_D, \text{etc.})$. This way of looking at persuasibility research helps to clarify the essential difference between bound and unbound factors. Unbound factors would enter with a sizable weight into *every one* of the regression equations, irrespective of the type of communication for which predictions are being made $(Y_A, Y_B, \ldots Y_Z)$. Bound factors, on the other hand, would have *varying* weights, ranging from zero in some regression equations to very high weights in others.

The concept of a set of multiple regression equations highlights the descriptive character of persuasibility factors. They are, in effect, individual traits whose consequences are directly measurable by observing changes in verbal behavior and in overt nonverbal behavior. They enable us to estimate the probability that a given individual will change his opinions or attitudes in response to a given class of communications. The unbound predispositions are communication-free factors which permit estimates concerning the probability of change in response to any communication, i.e. they purport to apply universally to all communications.

It should be noted, incidentally, that a given attribute (e.g. degree of motivation to conform to the demands of others) might turn out to be partly bound as well as unbound. That is to say, the attribute may be a communication-free factor because it enters into every regression formula with a substantial weight but, at the same time, it might be partly bound in that the weight may be much higher in a regression equation that applies to one particular class of communications (e.g. those which contain arguments and incentives appealing directly to the recipient's social conformity motives).

It should also be borne in mind that a seemingly unbound factor might actually be bound in a rather subtle or unexpected way. During the early stages of research, a given persuasibility factor may seem to be unbound, since it consistently enables better-than-chance predictions for a wide variety of communications differing in topic, communicator characteristics, media characteristics, and so forth. Subsequent research, however, might reveal that the factor is bound to some very broad category (e.g. it may apply to one-way mass-media situations but not to direct interpersonal relationships in which two-way communication takes place). Although more limited in its scope than had at first been apparent,

the factor might, nevertheless, remain a valuable predictive attribute for an extremely wide range of communication situations. This example again points to the need for regarding "bound" and "unbound" as end-points of a continuum rather than as a dichotomy, since there may be wide variation in "degree of boundedness."

Some bound factors may apply to such small or trivial classes of communications that they are of little value for predictive or theoretical purposes, whereas other bound factors may pertain to extensive and socially significant classes of communication. Certain bound factors may conceivably turn out to be almost as broad in scope as the unbound ones and may permit the formulation of some general laws of persuasibility with relatively few limiting conditions. Thus, the quest to discover unbound persuasibility factors need not be regarded as having failed in its scientific purposes when the investigator discovers instead a set of bound factors. If they are sufficiently broad in scope, they may help to formulate general propositions concerning the type of person who will be influenced by various kinds of social communications.

In line with this conception, we regard the purpose of the persuasibility research represented . . . to be that of *discovering and assessing both unbound factors and bound factors of broad scope.* . . .

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THE FUNCTIONAL APPROACH TO THE STUDY OF ATTITUDES

Daniel Katz

EARLY APPROACHES TO THE STUDY OF ATTITUDE AND OPINION

There have been two main streams of thinking with respect to the determination of man's attitudes. The one tradition assumes an irrational model of man: specifically it holds that men have very limited powers of reason and reflection, weak capacity to discriminate, only the most primitive self-insight, and very short memories. Whatever mental capacities people do possess are easily overwhelmed by emotional forces and appeals to self-interest and vanity. The early books on the psychology of advertising, with their emphasis on the doctrine of suggestion, exemplify this approach. One expression of this philosophy is in the propagandist's concern with tricks and traps to manipulate the public. A modern form of it appears in *The Hidden Persuaders*, or the use of subliminal and marginal suggestion, or the devices supposedly employed by "the Madison Avenue boys." Experiments to support this line of thinking started with laboratory demonstra-

tions of the power of hypnotic suggestion and were soon extended to show that people would change their attitudes in an uncritical manner under the influence of the prestige of authority and numbers. For example, individuals would accept or reject the same idea depending upon whether it came from a positive or a negative prestige source.[1]

The second approach is that of the ideologist who invokes a rational model of man. It assumes that the human being has a cerebral cortex, that he seeks understanding, that he consistently attempts to make sense of the world about him, that he possesses discriminating and reasoning powers which will assert themselves over time, and that he is capable of self-criticism and self-insight. It relies heavily upon getting adequate information to people. Our educational system is based upon this rational model. The present emphasis upon the improvement of communication, upon developing more adequate channels of two-way communication, of conferences and institutes, upon bringing people together to interchange ideas, are all indications of the belief in the importance of intelligence and comprehension in the formation and change of men's opinions.

Now either school of thought can point to evidence which supports its assumptions, and can make fairly damaging criticisms of its opponent. Solomon Asch and his colleagues, in attacking the irrational model, have called attention to the biased character of the old experiments on prestige suggestion which gave the subject little opportunity to demonstrate critical thinking.[2] And further exploration of subjects in these stupid situations does indicate that they try to make sense of a nonsensical matter as far as possible. Though the same statement is presented by the experimenter to two groups, the first time as coming from a positive source and the second time as coming from a negative source, it is given a different meaning dependent upon the context in which it appears.[3] Thus the experimental subject does his best to give some rational meaning to the problem. On the other hand, a large body of experimental work indicates that there are many limitations in the rational approach in that people see their world in terms of their own needs, remember what they want to remember, and interpret information on the basis of wishful thinking. H. H. Hyman and P. Sheatsley have demonstrated that these experimental results have direct relevance to information campaigns directed at influencing public opinion.[4] These authors assembled facts

[1] Muzafer Sherif, *The Psychology of Social Norms*, New York, Harper, 1936.

[2] Solomon E. Asch, *Social Psychology*, New York, Prentice-Hall, 1952.

[3] *Ibid.*, pp. 426–427. The following statement was attributed to its rightful author, John Adams, for some subjects and to Karl Marx for others: "those who hold and those who are without property have ever formed distinct interests in society." When the statement was attributed to Marx, this type of comment appeared: "Marx is stressing the need for a redistribution of wealth." When it was attributed to Adams, this comment appeared: "This social division is innate in mankind."

[4] Herbert H. Hyman and Paul B. Sheatsley, "Some Reasons Why Information Campaigns Fail," *Public Opinion Quarterly*, Vol. 11, 1947, pp. 413–423.

about such campaigns and showed conclusively that increasing the flow of information to people does not necessarily increase the knowledge absorbed or produce the attitude changes desired.

The major difficulty with these conflicting approaches is their lack of specification of the conditions under which men do act as the theory would predict. For the facts are that people do act at times as if they had been decorticated and at times with intelligence and comprehension. And people themselves do recognize that on occasion they have behaved blindly, impulsively, and thoughtlessly. A second major difficulty is that the rationality-irrationality dimension is not clearly defined. At the extremes it is easy to point to examples, as in the case of the acceptance of stupid suggestions under emotional stress on the one hand, or brilliant problem solving on the other; but this does not provide adequate guidance for the many cases in the middle of the scale where one attempts to discriminate between rationalization and reason.

RECONCILIATION OF THE CONFLICT
IN A FUNCTIONAL APPROACH

The conflict between the rationality and irrationality models was saved from becoming a worthless debate because of the experimentation and research suggested by these models. The findings of this research pointed toward the elements of truth in each approach and gave some indication of the conditions under which each model could make fairly accurate predictions. In general the irrational approach was at its best where the situation imposed heavy restrictions upon search behavior and response alternatives. Where individuals must give quick responses without adequate opportunities to explore the nature of the problem, where there are very few response alternatives available to them, where their own deep emotional needs are aroused, they will in general react much as does the unthinking subject under hypnosis. On the other hand, where the individual can have more adequate commerce with the relevant environmental setting, where he has time to obtain more feedback from his reality testing, and where he has a number of realistic choices, his behavior will reflect the use of his rational faculties.[5] The child will often respond to the directive of the parent not by implicit obedience but by testing out whether or not the parent really meant what he said.

[5] William A. Scott points out that in the area of international relations the incompleteness and remoteness of the information and the lack of pressures on the individual to defend his views results in inconsistencies. Inconsistent elements with respect to a system of international beliefs may, however, be consistent with the larger system of the personality. "Rationality and Non-rationality of International Attitudes," *Journal of Conflict Resolution*, Vol. 2, 1958, pp. 9–16.

Many of the papers in this issue, which describe research and theory concerning consistency and consonance, represent one outcome of the rationality model. The theory of psychological consonance, or cognitive balance, assumes that man attempts to reduce discrepancies in his beliefs, attitudes, and behavior by appropriate changes in these processes. While the emphasis here is upon consistency or logicality, the theory deals with all dissonances, no matter how produced. Thus they could result from irrational factors of distorted perception and wishful thinking as well as from rational factors of realistic appraisal of a problem and an accurate estimate of its consequences. Moreover, the theory would predict only that the individual will move to reduce dissonance, whether such movement is a good adjustment to the world or leads to the delusional systems of the paranoiac. In a sense, then, this theory would avoid the conflict between the old approaches of the rational and the irrational man by not dealing with the specific antecedent causes of behavior or with the particular ways in which the individual solves his problems.

In addition to the present preoccupation with the development of formal models concerned with cognitive balance and consonance, there is a growing interest in a more comprehensive framework for dealing with the complex variables and for bringing order within the field. The thoughtful system of Ulf Himmelstrand, presented in the following pages, is one such attempt. Another point of departure is represented by two groups of workers who have organized their theories around the functions which attitudes perform for the personality. Sarnoff, Katz, and McClintock, in taking this functional approach, have given primary attention to the motivational bases of attitudes and the processes of attitude change.[6] The basic assumption of this group is that both attitude formation and attitude change must be understood in terms of the needs they serve and that, as these motivational processes differ, so too will the conditions and techniques for attitude change. Smith, Bruner, and White have also analyzed the different functions which attitudes perform for the personality.[7] Both groups present essentially the same functions, but Smith, Bruner, and White give more attention to perceptual and cognitive processes and Sarnoff, Katz, and McClintock to the specific conditions of attitude change.

The importance of the functional approach is threefold. (1) Many previous studies of attitude change have dealt with factors which are not genuine psychological variables, for example, the effect on group prejudice of contact between two groups, or the exposure of a group of subjects to a communication in the mass media. Now contact serves different psychological functions for the individual and merely knowing that people have seen a movie or watched a television

[6] Irving Sarnoff and Daniel Katz, "The Motivational Bases of Attitude Change," *Journal of Abnormal and Social Psychology*, Vol. 49, 1954, pp. 115–124.

[7] M. Brewster Smith, Jerome S. Bruner, and Robert W. White, *Opinions and Personality*, New York, Wiley, 1956.

program tells us nothing about the personal values engaged or not engaged by such a presentation. If, however, we can gear our research to the functions attitudes perform, we can develop some generalizations about human behavior. Dealing with nonfunctional variables makes such generalization difficult, if not impossible.

(2) By concerning ourselves with the different functions attitudes can perform we can avoid the great error of oversimplification—the error of attributing a single cause to given types of attitude. It was once popular to ascribe radicalism in economic and political matters to the psychopathology of the insecure and to attribute conservatism to the rigidity of the mentally aged. At the present time it is common practice to see in attitudes of group prejudice the repressed hostilities stemming from childhood frustrations, though Hyman and Sheatsley have pointed out that prejudiced attitudes can serve a normative function of gaining acceptance in one's own group as readily as releasing unconscious hatred.[8] In short, not only are there a number of motivational forces to take into account in considering attitudes and behavior, but the same attitude can have a different motivational basis in different people.

(3) Finally, recognition of the complex motivational sources of behavior can help to remedy the neglect in general theories which lack specification of conditions under which given types of attitude will change. Gestalt theory tells us, for example, that attitudes will change to give better cognitive organization to the psychological field. This theoretical generalization is suggestive, but to carry out significant research we need some middle-level concepts to bridge the gap between a high level of abstraction and particularistic or phenotypical events. We need concepts that will point toward the types of motive and methods of motive satisfaction which are operative in bringing about cognitive reorganization.

Before we attempt a detailed analysis of the four major functions which attitudes can serve, it is appropriate to consider the nature of attitudes, their dimensions, and their relations to other psychological structures and processes.

NATURE OF ATTITUDES: THEIR DIMENSIONS

Attitude is the predisposition of the individual to evaluate some symbol or object or aspect of his world in a favorable or unfavorable manner. Opinion is the verbal expression of an attitude, but attitudes can also be expressed in nonverbal behavior. Attitudes include both the affective, or feeling core of liking or disliking, and the cognitive, or belief, elements which describe the object of the attitude, its characteristics, and its relations to other objects. All attitudes thus include be-

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[8] Herbert H. Hyman and Paul B. Sheatsley, "The Authoritarian Personality: A Methodological Critique," Richard Christie and Marie Jahoda, editors, *Studies in the Scope and Method of the Authoritarian Personality*, Glencoe, Ill., Free Press, 1954, pp. 50–122.

liefs, but not all beliefs are attitudes. When specific attitudes are organized into a hierarchical structure, they comprise *value systems*. Thus a person may not only hold specific attitudes against deficit spending and unbalanced budgets but may also have a systematic organization of such beliefs and attitudes in the form of a value system of economic conservatism.

The dimensions of attitudes can be stated more precisely if the above distinctions between beliefs and feelings and attitudes and value systems are kept in mind. The *intensity* of an attitude refers to the strength of the *affective* component. In fact, rating scales and even Thurstone scales deal primarily with the intensity of feeling of the individual for or against some social object. The cognitive, or belief, component suggests two additional dimensions, the *specificity* or *generality* of the attitude and the *degree of differentiation* of the beliefs. Differentiation refers to the number of beliefs or cognitive items contained in the attitude, and the general assumption is that the simpler the attitude in cognitive structure the easier it is to change.[9] For simple structures there is no defense in depth, and once a single item of belief has been changed the attitude will change. A rather different dimension of attitude is the *number and strength of its linkages to a related value system*. If an attitude favoring budget balancing by the Federal government is tied in strongly with a value system of economic conservatism, it will be more difficult to change than if it were a fairly isolated attitude of the person. Finally, the relation of the value system to the personality is a consideration of first importance. If an attitude is tied to a value system which is closely related to, or which consists of, the individual's conception of himself, then the appropriate change procedures become more complex. The *centrality* of an attitude refers to its role as part of a value system which is closely related to the individual's self-concept.

An additional aspect of attitudes is not clearly described in most theories, namely, their relation to action or overt behavior. Though behavior related to the attitude has other determinants than the attitude itself, it is also true that some attitudes in themselves have more of what Cartwright calls an action structure than do others.[10] Brewster Smith refers to this dimension as policy orientation [11] and Katz and Stotland speak of it as the action component.[12] For example, while many people have attitudes of approval toward one or the other of the two political parties, these attitudes will differ in their structure with respect

[9] David Krech and Richard S. Crutchfield, *Theory and Problems of Social Psychology*, New York, McGraw-Hill, 1948, pp. 160–163.

[10] Dorwin Cartwright, "Some Principles of Mass Persuasion," *Human Relations*, Vol. 2, 1949, pp. 253–267.

[11] M. Brewster Smith, "The Personal Setting of Public Opinions: A Study of Attitudes toward Russia," *Public Opinion Quarterly*, Vol. 11, 1947, pp. 507–523.

[12] Daniel Katz and Ezra Stotland, "A Preliminary Statement to a Theory of Attitude Structure and Change," Sigmund Koch, editor, *Psychology: A Study of a Science*, Vol. 3, New York, McGraw-Hill, 1959, pp. 423–475.

to relevant action. One man may be prepared to vote on election day and will know where and when he should vote and will go to the polls no matter what the weather or how great the inconvenience. Another man will only vote if a party worker calls for him in a car. Himmelstrand's work is concerned with all aspects of the relationship between attitude and behavior, but he deals with the action structure of the attitude itself by distinguishing between attitudes where the affect is tied to verbal expression and attitudes where the affect is tied to behavior concerned with more objective referents of the attitude.[13] In the first case an individual derives satisfaction from talking about a problem; in the second case he derives satisfaction from taking some form of concrete action.

Attempts to change attitudes can be directed primarily at the belief component or at the feeling, or affective, component. Rosenberg theorizes that an effective change in one component will result in changes in the other component and presents experimental evidence to confirm this hypothesis.[14] For example, a political candidate will often attempt to win people by making them like him and dislike his opponent, and thus communicate affect rather than ideas. If he is successful, people will not only like him but entertain favorable beliefs about him. Another candidate may deal primarily with ideas and hope that, if he can change people's beliefs about an issue, their feelings will also change.

FOUR FUNCTIONS WHICH ATTITUDES
PERFORM FOR THE INDIVIDUAL

The major functions which attitudes perform for the personality can be grouped according to their motivational basis as follows:

1. *The instrumental, adjustive, or utilitarian function* upon which Jeremy Bentham and the utilitarians constructed their model of man. A modern expression of this approach can be found in behavioristic learning theory.
2. *The ego-defensive function* in which the person protects himself from acknowledging the basic truths about himself or the harsh realities in his external world. Freudian psychology and neo-Freudian thinking have been preoccupied with this type of motivation and its outcomes.
3. *The value-expressive function* in which the individual derives satisfactions from expressing attitudes appropriate to his personal values and to his concept of himself. This function is central to doctrines of ego psychology which stress the importance of self-expression, self-development, and self-realization.
4. *The knowledge function* based upon the individual's need to give adequate structure to his universe. The search for meaning, the need to understand, the

[13] See pages 224–250, *Public Opinion Quarterly*, 1960.
[14] See pages 319–340, *Public Opinion Quarterly*, 1960.

trend toward better organization of perceptions and beliefs to provide clarity and consistency for the individual, are other descriptions of this function. The development of principles about perceptual and cognitive structure have been the contribution of Gestalt psychology.

Stated simply, the functional approach is the attempt to understand the reasons people hold the attitudes they do. The reasons, however, are at the level of psychological motivations and not of the accidents of external events and circumstances. Unless we know the psychological need which is met by the holding of an attitude we are in a poor position to predict when and how it will change. Moreover, the same attitude expressed toward a political candidate may not perform the same function for all people who express it. And while many attitudes are predominantly in the service of a single type of motivational process, as described above, other attitudes may serve more than one purpose for the individual. A fuller discussion of how attitudes serve the above four functions is in order.

1. THE ADJUSTMENT FUNCTION. Essentially this function is a recognition of the fact that people strive to maximize the rewards in their external environment and to minimize the penalties. The child develops favorable attitudes toward the objects in his world which are associated with the satisfactions of his needs and unfavorable attitudes toward objects which thwart him or punish him. Attitudes acquired in the service of the adjustment function are either the means for reaching the desired goal or avoiding the undesirable one, or are affective associations based upon experiences in attaining motive satisfactions.[15] The attitudes of the worker favoring a political party which will advance his economic lot are an example of the first type of utilitarian attitude. The pleasant image one has of one's favorite food is an example of the second type of utilitarian attitude.

In general, then, the dynamics of attitude formation with respect to the adjustment function are dependent upon present or past perceptions of the utility of the attitudinal object for the individual. The clarity, consistency, and nearness of rewards and punishments, as they relate to the individual's activities and goals, are important factors in the acquisition of such attitudes. Both attitudes and habits are formed toward specific objects, people, and symbols as they satisfy specific needs. The closer these objects are to actual need satisfaction and the more they are clearly perceived as relevant to need satisfaction, the greater are the probabilities of positive attitude formation. These principles of attitude formation are often observed in the breach rather than the compliance. In industry, management frequently expects to create favorable attitudes toward job performance through programs for making the company more attractive to the worker, such as providing recreational facilities and fringe benefits. Such programs, however, are much more likely to produce favorable attitudes toward the company as

[15] Katz and Stotland, *op. cit.*, pp. 434–443.

a desirable place to work than toward performance on the job. The company benefits and advantages are applied across the board to all employees and are not specifically relevant to increased effort in task performance by the individual worker.

Consistency of reward and punishment also contributes to the clarity of the instrumental object for goal attainment. If a political party bestows recognition and favors on party workers in an unpredictable and inconsistent fashion, it will destroy the favorable evaluation of the importance of working hard for the party among those whose motivation is of the utilitarian sort. But, curiously, while consistency of reward needs to be observed, 100 per cent consistency is not as effective as a pattern which is usually consistent but in which there are some lapses. When animal or human subjects are invariably rewarded for a correct performance, they do not retain their learned responses as well as when the reward is sometimes skipped.[16]

2. THE EGO-DEFENSIVE FUNCTION.   People not only seek to make the most of their external world and what it offers, but they also expend a great deal of their energy on living with themselves. The mechanisms by which the individual protects his ego from his own unacceptable impulses and from the knowledge of threatening forces from without, and the methods by which he reduces his anxieties created by such problems, are known as mechanisms of ego defense. A more complete account of their origin and nature will be found in Sarnoff's article. . . .[17] They include the devices by which the individual avoids facing either the inner reality of the kind of person he is, or the outer reality of the dangers the world holds for him. They stem basically from internal conflict with its resulting insecurities. In one sense the mechanisms of defense are adaptive in temporarily removing the sharp edges of conflict and in saving the individual from complete disaster. In another sense they are not adaptive in that they handicap the individual in his social adjustments and in obtaining the maximum satisfactions available to him from the world in which he lives. The worker who persistently quarrels with his boss and with his fellow workers, because he is acting out some of his own internal conflicts, may in this manner relieve himself of some of the emotional tensions which beset him. He is not, however, solving his problem of adjusting to his work situation and thus may deprive himself of advancement or even of steady employment.

Defense mechanisms, Miller and Swanson point out, may be classified into two families on the basis of the more or less primitive nature of the devices employed.[18] The first family, more primitive in nature, are more socially handi-

16 William O. Jenkins and Julian C. Stanley, "Partial Reinforcement: A Review and Critique," *Psychological Bulletin*, Vol. 47, 1950, pp. 193–234.

17 See pp. 251–279, *Public Opinion Quarterly*, 1960.

18 Daniel R. Miller and Guy E. Swanson, *Inner Conflict and Defense*, New York, Holt, 1960, pp. 194–288.

capping and consist of denial and complete avoidance. The individual in such cases obliterates through withdrawal and denial the realities which confront him. The exaggerated case of such primitive mechanisms is the fantasy world of the paranoiac. The second type of defense is less handicapping and makes for distortion rather than denial. It includes rationalization, projection, and displacement.

Many of our attitudes have the function of defending our self-image. When we cannot admit to ourselves that we have deep feelings of inferiority we may project those feelings onto some convenient minority group and bolster our egos by attitudes of superiority toward this underprivileged group. The formation of such defensive attitudes differs in essential ways from the formation of attitudes which serve the adjustment function. They proceed from within the person, and the objects and situation to which they are attached are merely convenient outlets for their expression. Not all targets are equally satisfactory for a given defense mechanism, but the point is that the attitude is not created by the target but by the individual's emotional conflicts. And when no convenient target exists the individual will create one. Utilitarian attitudes, on the other hand, are formed with specific reference to the nature of the attitudinal object. They are thus appropriate to the nature of the social world to which they are geared. The high school student who values high grades because he wants to be admitted to a good college has a utilitarian attitude appropriate to the situation to which it is related.

All people employ defense mechanisms, but they differ with respect to the extent that they use them and some of their attitudes may be more defensive in function than others. It follows that the techniques and conditions for attitude change will not be the same for ego-defensive as for utilitarian attitudes.

Moreover, though people are ordinarily unaware of their defense mechanisms, especially at the time of employing them, they differ with respect to the amount of insight they may show at some later time about their use of defenses. In some cases they recognize that they have been protecting their egos without knowing the reason why. In other cases they may not even be aware of the devices they have been using to delude themselves.

3. THE VALUE-EXPRESSIVE FUNCTION. While many attitudes have the function of preventing the individual from revealing to himself and others his true nature, other attitudes have the function of giving positive expression to his central values and to the type of person he conceives himself to be. A man may consider himself to be an enlightened conservative or an internationalist or a liberal, and will hold attitudes which are the appropriate indication of his central values. Thus we need to take account of the fact that not all behavior has the negative function of reducing the tensions of biological drives or of internal conflicts. Satisfactions also accrue to the person from the expression of attitudes which reflect his cherished beliefs and his self-image. The reward to the person in these instances is not so much a matter of gaining social recognition or monetary rewards as of establishing his self-identity and confirming his notion of the sort of

person he sees himself to be. The gratifications obtained from value expression may go beyond the confirmation of self-identity. Just as we find satisfaction in the exercise of our talents and abilities, so we find reward in the expression of any attributes associated with our egos.

Value-expressive attitudes not only give clarity to the self-image but also mold that self-image closer to the heart's desire. The teenager who by dress and speech establishes his identity as similar to his own peer group may appear to the outsider a weakling and a craven conformer. To himself he is asserting his independence of the adult world to which he has rendered childlike subservience and conformity all his life. Very early in the development of the personality the need for clarity of self-image is important—the need to know "who I am." Later it may be even more important to know that in some measure I am the type of person I want to be. Even as adults, however, the clarity and stability of the self-image is of primary significance. Just as the kind, considerate person will cover over his acts of selfishness, so too will the ruthless individualist become confused and embarrassed by his acts of sympathetic compassion. One reason it is difficult to change the character of the adult is that he is not comfortable with the new "me." Group support for such personality change is almost a necessity, as in Alcoholics Anonymous, so that the individual is aware of approval of his new self by people who are like him.

The socialization process during the formative years sets the basic outlines for the individual's self-concept. Parents constantly hold up before the child the model of the good character they want him to be. A good boy eats his spinach, does not hit girls, etc. The candy and the stick are less in evidence in training the child than the constant appeal to his notion of his own character. It is small wonder, then, that children reflect the acceptance of this model by inquiring about the characters of the actors in every drama, whether it be a television play, a political contest, or a war, wanting to know who are the "good guys" and who are the "bad guys." Even as adults we persist in labeling others in the terms of such character images. Joe McCarthy and his cause collapsed in fantastic fashion when the telecast of the Army hearings showed him in the role of the villain attacking the gentle, good man represented by Joseph Welch.

A related but somewhat different process from childhood socialization takes place when individuals enter a new group or organization. The individual will often take over and internalize the values of the group. What accounts, however, for the fact that sometimes this occurs and sometimes it does not? Four factors are probably operative, and some combination of them may be necessary for internalization. (1) The values of the new group may be highly consistent with existing values central to the personality. The girl who enters the nursing profession finds it congenial to consider herself a good nurse because of previous values of the importance of contributing to the welfare of others. (2) The new group may in its ideology have a clear model of what the good group member should be like and may persistently indoctrinate group members in these terms.

One of the reasons for the code of conduct for members of the armed forces, devised after the revelations about the conduct of American prisoners in the Korean War, was to attempt to establish a model for what a good soldier does and does not do. (3) The activities of the group in moving toward its goal permit the individual genuine opportunity for participation. To become ego-involved so that he can internalize group values, the new member must find one of two conditions. The group activity open to him must tap his talents and abilities so that his chance to show what he is worth can be tied into the group effort. Or else the activities of the group must give him an active voice in group decisions. His particular talents and abilities may not be tapped but he does have the opportunity to enter into group decisions, and thus his need for self-determination is satisfied. He then identifies with the group in which such opportunities for ego-involvement are available. It is not necessary that opportunities for self-expression and self-determination be of great magnitude in an objective sense, so long as they are important for the psychological economy of the individuals themselves. (4) Finally, the individual may come to see himself as a group member if he can share in the rewards of group activity which includes his own efforts. The worker may not play much of a part in building a ship or make any decisions in the process of building it. Nevertheless, if he and his fellow workers are given a share in every boat they build and a return on the proceeds from the earnings of the ship, they may soon come to identify with the ship-building company and see themselves as builders of ships.

4. THE KNOWLEDGE FUNCTION. Individuals not only acquire beliefs in the interest of satisfying various specific needs, they also seek knowledge to give meaning to what would otherwise be an unorganized chaotic universe. People need standards or frames of reference for understanding their world, and attitudes help to supply such standards. The problem of understanding, as John Dewey made clear years ago, is one "of introducing (1) *definiteness* and *distinction* and (2) *consistency* and *stability* of meaning into what is otherwise vague and wavering." [19] The definiteness and stability are provided in good measure by the norms of our culture, which give the otherwise perplexed individual ready-made attitudes for comprehending his universe. Walter Lippmann's classical contribution to the study of opinions and attitudes was his description of stereotypes and the way they provided order and clarity for a bewildering set of complexities.[20] The most interesting finding in Herzog's familiar study of the gratifications obtained by housewives in listening to daytime serials was the unsuspected role of information and advice.[21] The stories were liked "because they explained things to the inarticulate listener."

[19] John Dewey, *How We Think*, New York, Macmillan, 1910.

[20] Walter Lippmann, *Public Opinion*, New York, Macmillan, 1922.

[21] Herta Herzog, "What Do We Really Know about Daytime Serial Listeners?" in Paul F. Lazarsfeld and Frank N. Stanton, editors, *Radio Research 1942–1943*, New York, Duell, Sloan & Pearce, 1944, pp. 3–33.

The need to know does not of course imply that people are driven by a thirst for universal knowledge. The American public's appalling lack of political information has been documented many times. In 1956, for example, only 13 per cent of the people in Detroit could correctly name the two United States Senators from the state of Michigan and only 18 per cent knew the name of their own Congressman.[22] People are not avid seekers after knowledge as judged by what the educator or social reformer would desire. But they do want to understand the events which impinge directly on their own life. Moreover, many of the attitudes they have already acquired give them sufficient basis for interpreting much of what they perceive to be important for them. Our already existing stereotypes, in Lippmann's language, "are an ordered, more or less consistent picture of the world, to which our habits, our tastes, our capacities, our comforts and our hopes have adjusted themselves. They may not be a complete picture of the world, but they are a picture of a possible world to which we are adapted." [23] It follows that new information will not modify old attitudes unless there is some inadequacy or incompleteness or inconsistency in the existing attitudinal structure as it relates to the perceptions of new situations. . . .

DETERMINANTS OF ATTITUDE AROUSAL
AND ATTITUDE CHANGE

The problems of attitude arousal and of attitude change are separate problems. The first has to do with the fact that the individual has many predispositions to act and many influences playing upon him. Hence we need a more precise description of the appropriate conditions which will evoke a given attitude. The second problem is that of specifying the factors which will help to predict the modification of different types of attitude.

The most general statement that can be made concerning attitude arousal is that it is dependent upon the excitation of some need in the individual, or some relevant cue in the environment. When a man grows hungry, he talks of food. Even when not hungry he may express favorable attitudes toward a preferred food if an external stimulus cues him. The ego-defensive person who hates foreigners will express such attitudes under conditions of increased anxiety or threat or when a foreigner is perceived to be getting out of place.

The most general statement that can be made about the conditions conducive to attitude change is that the expression of the old attitude or its anticipated expression no longer gives satisfaction to its related need state. In other words, it no longer serves its function and the individual feels blocked or frustrated. Modi-

[22] From a study of the impact of party organization on political behavior in the Detroit area, by Daniel Katz and Samuel Eldersveld, in manuscript.

[23] Lippmann, *op. cit.*, p. 95.

fying an old attitude or replacing it with a new one is a process of learning, and learning always starts with a problem, or being thwarted in coping with a situation. Being blocked is a necessary, but not a sufficient, condition for attitude change. Other factors must be operative and will vary in effectiveness depending upon the function involved.

AROUSING AND CHANGING UTILITARIAN ATTITUDES

Political parties have both the problem of converting people with antagonistic attitudes (attitude change) and the problem of mobilizing the support of their own followers (attitude arousal). To accomplish the latter they attempt to revive the needs basic to old attitudes. For example, the Democrats still utilize the appeals of the New Deal and the Republicans still talk of the balanced budget. The assumption is that many people still hold attitudes acquired in earlier circumstances and that appropriate communication can reinstate the old needs. For most people, however, utilitarian needs are reinforced by experience and not by verbal appeals. Hence invoking the symbols of the New Deal will be relatively ineffective with respect to adjustive attitudes unless there are corresponding experiences with unemployment, decreased income, etc. Though the need state may not be under the control of the propagandist, he can exaggerate or minimize its importance. In addition to playing upon states of need, the propagandist can make perceptible the old cues associated with the attitude he is trying to elicit. These cues may have associated with them favorable affect, or feeling, though the related needs are inactive. For example, the fighters for old causes can be paraded across the political platform in an attempt to arouse the attitudes of the past.

The two basic conditions, then, for the arousal of existing attitudes are the activation of their relevant need states and the perception of the appropriate cues associated with the content of the attitude.

To change attitudes which serve a utilitarian function, one of two conditions must prevail: (1) the attitude and the activities related to it no longer provide the satisfactions they once did, or (2) the individual's level of aspiration has been raised. The Chevrolet owner who had positive attitudes toward his old car may now want a more expensive car commensurate with his new status.

Again the mass media play a role secondary to direct experience in changing attitudes directly related to economic matters. Once dissatisfaction exists, they can exert a potent influence in suggesting new ways of solving the problem. In the field of international affairs, mass media have a more primary role because in times of peace most people have no direct experience with other countries or their peoples. The threat of war comes from what they read, hear, or see in the mass media.

The area of freedom for changing utilitarian attitudes is of course much greater in dealing with methods of satisfying needs than with needs themselves. Needs change more slowly than the means for gratifying them, even though one role of the advertiser is to create new needs. Change in attitudes occurs more readily when people perceive that they can accomplish their objectives through revising existing attitudes. Integration of white and Negro personnel in the armed forces came to pass partly because political leaders and military leaders perceived that such a move would strengthen our fighting forces. And one of the powerful arguments for changing our attitudes toward Negroes is that in the struggle for world democracy we need to put our own house in order to present a more convincing picture of our own society to other countries. Carlson has experimentally demonstrated that discriminatory attitudes toward minority groups can be altered by showing the relevance of more positive beliefs to such individual goals and values as American international prestige and democratic equalitarianism.[24]

Just as attitudes formed in the interests of adjustment can be negative evaluations of objects associated with avoidance of the harmful effects of the environment, so too can attitudes change because of unpleasant experiences or anticipation of harmful consequences. The more remote the cause of one's suffering the more likely he is to seize upon a readily identifiable target for his negative evaluation. Public officials, as highly visible objects, can easily be associated with states of dissatisfaction. Thus there is truth in the old observation that people vote more against the candidates they dislike than for the candidates they like.

The use of negative sanctions and of punishment to change utilitarian attitudes is more complex than the use of rewards. To be successful in changing attitudes and behavior, punishment should be used only when there is clearly available a course of action that will save the individual from the undesirable consequences. To arouse fear among the enemy in time of war does not necessarily result in desertion, surrender, or a disruption of the enemy war effort. Such channels of action may not be available to the people whose fears are aroused. The experiment of Janis and Feshback in using fear appeals to coerce children into good habits of dental hygiene had the interesting outcome of a negative relationship between the amount of fear and the degree of change. Lurid pictures of the gangrene jaws of old people who had not observed good dental habits were not effective.[25] Moreover, the group exposed to the strongest fear appeal was the most susceptible to counterpropaganda. One factor which helps to account for the results of this investigation was the lack of a clear-cut relation in the minds of the children between failure to brush their teeth in the prescribed manner and the pictures of the gangrene jaws of the aged.

[24] Earl R. Carlson, "Attitude Change through Modification of Attitude Structure," *Journal of Abnormal and Social Psychology*, Vol. 52, 1956, pp. 256–261.

[25] Irving L. Janis and Seymour Feshback, "Effects of Fear-arousing Communications," *Journal of Abnormal and Social Psychology*, Vol. 48, 1953, pp. 78–92.

The necessity of coupling fear appeals with clear channels of action is illustrated by a study of Nunnally and Bobren.[26] These investigators manipulated three variables in communications about mental health, namely, the relative amount of message anxiety, the degree to which messages gave apparent solutions, and the relative personal or impersonal phrasing of the message. The high-anxiety message described electric shock treatment of the psychotic in distressing detail. People showed the least willingness to receive communications that were high in anxiety, personalized, and offered no solutions. When solutions were offered in the communication, there was more willingness to accept the high-anxiety message.

The use of punishment and arousal of fear depend for their effectiveness upon the presence of well-defined paths for avoiding the punishment, i.e. negative sanctions are successful in redirecting rather than suppressing behavior. When there is no clearly perceptible relation between the punishment and the desired behavior, people may continue to behave as they did before, only now they have negative attitudes toward the persons and objects associated with the negative sanctions. There is, however, another possibility if the punishment is severe or if the individual is unusually sensitive. He may develop a defensive avoidance of the whole situation. His behavior, then, is not directed at solving the problem but at escaping from the situation, even if such escape has to be negotiated by absorbing extra punishment. The attitudes under discussion are those based upon the adjustive or utilitarian function, but if the individual is traumatized by a fearful experience he will shift from instrumental learning to defensive reactions.

AROUSAL AND CHANGE OF EGO-DEFENSIVE ATTITUDES

Attitudes which help to protect the individual from internally induced anxieties or from facing up to external dangers are readily elicited by any form of threat to the ego. The threat may be external, as in the case of a highly competitive situation, or a failure experience, or a derogatory remark. It is the stock in trade of demagogues to exaggerate the dangers confronting the people, for instance, Joe McCarthy's tactics with respect to Communists in the State Department. Many people have existing attitudes of withdrawal or of aggression toward deviants or out-groups based upon their ego-defensive needs. When threatened, these attitudes come into play, and defensive people either avoid the unpleasant situation entirely, as is common in the desegregation controversy, or exhibit hostility.

Another condition for eliciting the ego-defensive attitude is the encouragement given to its expression by some form of social support. The agitator may appeal to repressed hatred by providing moral justification for its expression. A mob leader before an audience with emotionally held attitudes toward Negroes

[26] Jum C. Nunnally and Howard M. Bobren, "Variables Governing the Willingness to Receive Communications in Mental Health," *Journal of Personality*, Vol. 27, 1959, pp. 38–46.

may call out these attitudes in the most violent form by invoking the good of the community or the honor of white womanhood.

A third condition for the arousal of ego-defensive attitudes is the appeal to authority. The insecurity of the defensive person makes him particularly suscepti- ble to authoritarian suggestion. When this type of authoritarian command is in the direction already indicated by his attitudes of antipathy toward other people, he responds quickly and joyously. It is no accident that movements of hate and aggression such as the Ku Klux Klan or the Nazi Party are authoritarian in their organized structure. Wagman, in an experimental investigation of the uses of au- thoritarian suggestion, found that students high in ego-defensiveness as measured by the F-scale were much more responsive to directives from military leaders than were less defensive students.[27] In fact, the subjects low in defensiveness were not affected at all by authoritarian suggestion when this influence ran count- er to their own attitudes. The subjects in F-scores could be moved in either direction, although they moved more readily in the direction of their own beliefs.

A fourth condition for defensive arousal is the building up over time of in- hibited drives in the individual, for example, repressed sex impulses. As the drive strength of forbidden impulses increases, anxiety mounts and release from ten- sion is found in the expression of defensive attitudes. The deprivations of prison life, for example, build up tensions which can find expression in riots against the hated prison officials.

In other words, the drive strength for defensive reactions can be increased by situation frustration. Though the basic source is the long-standing internal conflict of the person, he can encounter additional frustration in immediate cir- cumstances. Berkowitz has shown that anti-Semitic girls were more likely than less prejudiced girls to display aggression toward an innocent bystander when angered by a third person.[28] In a subsequent experiment, Berkowitz and Holmes created dislike by one group of subjects for their partners by giving them electric shocks which they thought were administered by their partners.[29] In a second session, subjects worked alone and were threatened by the experimenter. In a third session they were brought together with their partners for a cooperative task of problem solving. Aggression and hostility were displayed by subjects to- ward one another in the third session as a result of the frustration produced by the experimenter, and were directed more against the disliked partner than to- ward an innocuous partner.

Studies outside the laboratory have confirmed the principle that, where neg-

[27] Morton Wagman, "Attitude Change and the Authoritarian Personality," *Journal of Psychology*, Vol. 40, 1955, pp. 3–24. The F-scale is a measure of authoritarianism comprising items indicative of both defensiveness and ideology.

[28] Leonard Berkowitz, "Anti-Semitism and the Displacement of Aggression," *Journal of Abnormal and Social Psychology*, Vol. 59, 1959, pp. 182–188.

[29] Leonard Berkowitz and Douglas S. Holmes, "The Generalization of Hostility to Disliked Objects," *Journal of Personality*, Vol. 27, 1959, pp. 565–577.

ative attitudes exist, frustration in areas unrelated to the attitude will increase the strength of the prejudice. Bettelheim and Janowitz found that war veterans who had suffered downward mobility were more anti-Semitic than other war veterans.[30] In a secondary analysis of the data from the Elmira study, Greenblum and Pearlin report that the socially mobile people, whether upward or downward mobile, were more prejudiced against Jews and Negroes than were stationary people, provided that the socially mobile were insecure about their new status.[31] Though it is clear in these studies that the situation frustration strengthens a negative attitude, it is not clear as to the origin of the negative attitude.

Most research on ego-defensive attitudes has been directed at beliefs concerning the undesirable character of minority groups or of deviants, with accompanying feelings of distrust, contempt, and hatred. Many ego-defensive attitudes, however, are not the projection of repressed aggression but are expressions of apathy or withdrawal. The individual protects himself from a difficult or demanding world and salvages his self-respect by retreating within his own shell. His attitudes toward political matters are anomic: "It does not make any difference to people like me which party is in power" or "There is no point in voting because I can't influence the outcome." Threat to people of this type takes the form of a complexity with which they cannot cope. Thus, they daydream when the lecturer talks about economic theories of inflation or the public official talks about disarmament proposals.

The usual procedures for changing attitudes and behavior have little positive effect upon attitudes geared into our ego defenses. In fact they may have a boomerang effect of making the individual cling more tenaciously to his emotionally held beliefs. In the category of usual procedures should be included increasing the flow of information, promising and bestowing rewards, and invoking penalties. As has already been indicated, punishment is threatening to the ego-defensive person and the increase of threat is the very condition which will feed ego-defensive behavior. The eneuretic youngster with emotional problems is rarely cured by punishment. Teachers and coaches know that there are some children who respond to censure and punishment by persevering in the forbidden behavior. But what is not as well recognized is that reward is also not effective in modifying the actions of the ego-defensive person. His attitudes are an expression of his inner conflicts and are not susceptible to external rewards. The shopkeeper who will not serve Negroes because they are a well-fixated target for his aggressions will risk the loss of income incurred by his discriminatory reactions.

Three basic factors, however, can help change ego-defensive attitudes. In the

[30] Bruno Bettelheim and Morris Janowitz, *Dynamics of Prejudice*, New York, Harper, 1950.

[31] Joseph Greenblum and Leonard I. Pearlin, "Vertical Mobility and Prejudice," Reinhard Bendix and Seymour M. Lipset, editors, *Class, Status and Power*, Glencoe, Ill., Free Press, 1953.

first place, the removal of threat is a necessary though not a sufficient condition. The permissive and even supportive atmosphere which the therapist attempts to create for his patients is a special instance of the removal of threat. Where the ego-defensive behavior of the delinquent is supported by his group, the social worker must gain a measure of group acceptance so as not to be perceived as a threat by the individual gang members. An objective, matter-of-fact approach can serve to remove threat, especially in situations where people are accustomed to emotional appeals. Humor can also be used to establish a nonthreatening atmosphere, but it should not be directed against the audience or even against the problem. Cooper and Jahoda attempted to change prejudiced attitudes by ridicule, in the form of cartoons which made Mr. Biggott seem silly, especially when he rejected a blood transfusion which did not come from 100 per cent Americans.[32] Instead of changing their attitudes, the subjects in this experiment found ways of evading the meaning of the cartoons.

In the second place, catharsis or the ventilation of feelings can help to set the stage for attitude change. Mention has already been made of the building up of tension owing to the lack of discharge of inhibited impulses. When emotional tension is at a high level the individual will respond defensively and resist attempts to change him. Hence, providing him with opportunities to blow off steam may often be necessary before attempting a serious discussion of new possibilities of behavior. Again, humor can serve this purpose.

There are many practical problems in the use of catharsis, however, because of its complex relationship to other variables. In his review of the experimental work on the expression of hostility Berkowitz reports more findings supporting than contradicting the catharsis hypothesis, but there is no clear agreement about the mechanisms involved.[33] Under certain circumstances permitting emotional outbursts can act as a reward. In a gripe session to allow individuals to express their complaints, group members can reinforce one another's negative attitudes. Unless there are positive forces in the situation which lead to a serious consideration of the problem, the gripe session may have boomerang effects. The technique often employed is to keep the group in session long enough for the malcontents to get talked out so that more sober voices can be heard. Catharsis may function at two levels. It can operate to release or drain off energy of the moment, as in the above description. It can also serve to bring to the surface something of the nature of the conflict affecting the individual. So long as his impulses are repressed and carefully disguised, the individual has little chance of gaining even rudimentary insight into himself.

[32] Eunice Cooper and Marie Jahoda, "The Evasion of Propaganda: How Prejudiced People Respond to Anti-prejudice Propaganda," *Journal of Psychology*, Vol. 23, 1947, pp. 15–25.

[33] Leonard Berkowitz, "The Expression and Reduction of Hostility," *Psychological Bulletin*, Vol. 55, 1958, pp. 257–283.

In the third place, ego-defensive behavior can be altered as the individual acquires insight into his own mechanisms of defense. Information about the nature of the problem in the external world will not affect him. Information about his own functioning may have an influence, if presented without threat, and if the defenses do not go too deep into the personality. In other words, only prolonged therapy can help the psychologically sick person. Many normal people, however, employ ego defenses about which they have some degree of awareness, though generally not at the time of the expression of such defenses. The frustrations of a tough day at work may result in an authoritarian father displacing his aggression that night on his family in yelling at his wife, or striking his youngsters. Afterward he may recognize the cause of his behavior. Not all defensive behavior, then, is so deep rooted in the personality as to be inaccessible to awareness and insight. Therefore, procedures for arousing self-insight can be utilized to change behavior, even in mass communications.

One technique is to show people the psychodynamics of attitudes, especially as they appear in the behavior of others. Allport's widely used pamphlet on the ABC's of Scapegoating is based upon the technique.[34] Katz, Sarnoff, and McClintock have conducted experimental investigations of the effects of insightful materials upon the reduction of prejudice.[35] In their procedure the psychodynamics of prejudice was presented in the case history of a subject sufficiently similar to the subjects as to appear as a sympathetic character. Two findings appeared in these investigations: (1) Subjects who were very high in defensiveness were not affected by the insight materials, but subjects of low or moderate defensiveness were significantly affected. (2) The changes in attitude produced by the arousal of self-insight persisted for a longer period of time than changes induced by information or conformity pressures. In a further experiment Stotland, Katz, and Patchen found that involving subjects in the task of understanding the dynamics of prejudice helped arouse self-insight and reduce prejudice.[36] McClintock compared an ethnocentric appeal, an information message, and self-insight materials, with similar results.[37] There was differential acceptance of these influences according to the personality pattern of the subject. McClintock also found a difference in F-scale items in predicting attitude change, with the projectivity items showing a different pattern from the conformity items.

Of practical concern are four general areas in which insufficient attention

[34] Gordon W. Allport, *The Nature of Prejudice*, Cambridge, Mass., Addison-Wesley, 1954.

[35] Daniel Katz, Irving Sarnoff, and Charles McClintock, "Ego Defense and Attitude Change," *Human Relations*, Vol. 9, 1956, pp. 27–46. Also their "The Measurement of Ego Defense as Related to Attitude Change," *Journal of Personality*, Vol. 25, 1957, pp. 465–474.

[36] Ezra Stotland, Daniel Katz, and Martin Patchen, "The Reduction of Prejudice through the Arousal of Self-insight," *Journal of Personality*, Vol. 27, 1959, pp. 507–531.

[37] Charles McClintock, "Personality Syndromes and Attitude Change," *Journal of Personality*, Vol. 26, 1958, pp. 479–593.

has been paid to the ego-defensive basis of attitudes with respect to the role of communication in inducing social change:

1. Prejudices toward foreigners, toward racial and religious out-groups, and toward international affairs often fall into this category. The thesis of the authors of *The Authoritarian Personality* that the defenses of repression and projectivity are correlated with racial prejudice has seen more confirmation than disproof in spite of the fact that not all racial prejudice is ego-defensive in nature. In a review of studies involving the California F-scale, Titus and Hollander report investigations where positive correlations were obtained between high scores on authoritarianism and prejudice and xenophobia.[38]

Of course not all the variance in social prejudice can be accounted for by ego-defensiveness. Pettigrew has shown that a sample of Southern respondents was almost identical with a sample of Northern respondents on the F-scale measure of authoritarianism, but the Southern sample was much more negative toward Negroes with respect to employment, housing, and voting.[39]

Relations have also been found between authoritarianism and attitudes toward nationalism and internationalism. Levinson constructed a scale to give an index of internationalism which included such items as opinions about immigration policy, armaments, the get-tough with Russia policy, cooperation with Red China, our role in the UN, etc. This measure of internationalism correlated .60 with the F-scale.[40] A study by Lane in 1952 showed that a larger proportion of authoritarians than of equalitarians were against working toward a peaceful settlement of the Korean issue. The authoritarians either favored the bombing of China and Manchuria or else were for complete withdrawal.[41] And Smith and Rosen found such consistent negative relations between world-mindedness and the dimension of authoritarianism that they suggested in the interest of parsimony the two be considered as slightly different aspects of the same basic personality structure.[42]

2. A related area of attitudes consists of opinions toward deviant types of personalities, e.g. delinquents, the mentally ill, Beatniks, and other nonconformers. The problem of the rehabilitation of the ex-convict or the discharged mental patient is sometimes impeded by the emotional attitudes of the public toward individuals with a record of institutionalization.

[38] H. Edwin Titus and E. P. Hollander, "The California F-Scale in Psychological Research: 1950–1955," *Psychological Bulletin*, Vol. 54, 1957, pp. 47–64.

[39] Thomas F. Pettigrew, "Personality and Socio-cultural Factors in Intergroup Attitudes: A Cross-national Comparison," *Journal of Conflict Resolution*, Vol. 2, 1958, pp. 29–42.

[40] Daniel J. Levinson, "Authoritarian Personality and Foreign Personality," *Journal of Conflict Resolution*, Vol. 1, 1957, pp. 37–47.

[41] Robert E. Lane, "Political Personality and Electoral Choice," *American Political Science Review*, Vol. 49, 1955, pp. 173–190.

[42] Howard P. Smith and Ellen W. Rosen, "Some Psychological Correlates of World-mindedness and Authoritarianism," *Journal of Personality*, Vol. 26, 1958, pp. 170–183.

3. Attitudes toward public health measures, whether the fluoridation of the water supply of a community, the utilization of X-ray examinations for the prevention of disease, or the availability of information about birth control, often have their roots in unacknowledged anxieties and fears. Davis, for example, believes that opposition to fluoridation is not so much a matter of ignorance of the specific problem as it is a function of a deeper attitudinal syndrome of naturalism.[43] Governmental interference with natural processes is regarded as the source of many evils, and this general ideology is tinged with suspicion and distrust suggestive of defensive motivation.

4. Apathy toward political issues and especially toward atomic weapons may reflect a defensive withdrawal on the part of some people. The information officer of a government agency or the public relations officer in charge of a health campaign faces the difficult problem of changing public attitudes which may satisfy different needs for different people. To present information designed to show the dangerous situation we are in may be effective for some people but may prove too threatening for others. What is needed in such cases is research which will get at the reasons why people hold the attitudes they do. There are times when dramatically confronting the public with the dangers of a situation may be more effective strategy than a more reassuring approach. But there are also occasions when the first strategy will merely add to defensive avoidance. Gladstone and Taylor presented communications to their students, two of which were news stories from the *New York Times*.[44] One reported speeches made by Malenkov and Khrushchev about the peaceful intentions of the Soviet Union but its readiness to crush aggressors. The second news story reported British reactions to the American opinion about the situation in Indo-China. A third communication concerned the H-bomb and its dangers. Students were previously tested on their susceptibility to being threatened. Those who were threat-prone tended to deny the truth of the points in the communications or to overlook them entirely. For these subjects the communications had no effect on existing attitudes.

The use of mass communication has been better adapted to supplying information and to emphasizing the advantages of a course of action than to changing defensive attitudes. A new field in communication to large publics is the creation of self-understanding, which so far has been pre-empted by personal advice columns. The specifics for this new development remain to be worked out, but they may well start with techniques based upon attitude research of the basic reasons for resistance to an objectively desirable program.

[43] Morris Davis, "Community Attitudes toward Fluoridation," *Public Opinion Quarterly*, Vol. 23, 1959, pp. 474–482.

[44] Arthur I. Gladstone and Martha A. Taylor, "Threat-related Attitudes and Reactions to Communication about International Events," *Journal of Conflict Resolution*, Vol. 2, 1958, pp. 17–28.

CONDITIONS FOR AROUSING AND CHANGING
VALUE-EXPRESSIVE ATTITUDES

Two conditions for the arousal of value-expressive attitudes can be specified. The first is the occurrence of the cue in the stimulus situation which has been associated with the attitude. The liberal Democrat, as a liberal Democrat, has always believed in principle that an income tax is more just than a sales tax. Now the issue has arisen in his state, and the group in which he happens to be at the moment are discussing an increase in sales tax. This will be sufficient to cue off his opposition to the proposal without consideration of the specific local aspects of the tax problem. The second condition for the arousal of this type of attitude is some degree of thwarting of the individual's expressive behavior in the immediate past. The housewife occupied with the routine care of the home and the children during the day may seek opportunities to express her views to other women at the first social gathering she attends.

We have referred to voters backing their party for bread and butter reasons. Perhaps the bulk of voting behavior, however, is the elicitation of value-expressive attitudes. Voting is a symbolic expression of being a Republican or a Democrat. Party identification accounts for more variance in voting behavior than any other single factor.[45] Though there is a minority who consider themselves independent and though there are minor shifts in political allegiance, the great majority of the people identify themselves as the supporters of a political party. Their voting behavior is an expression of this self-concept, and it takes a major event such as a depression to affect their voting habits seriously.

Identification with party is in good measure a function of the political socialization of the child, as Hyman has shown.[46] An analysis of a national sample of the electorate in 1952 by Campbell, Gurin, and Miller revealed that of voters both of whose parents were Democrats, 76 per cent identified themselves as Democrats, another 10 per cent as independent Democrats, and 12 per cent as Republicans.[47] Similarly, of those with Republican parents 63 per cent considered themselves Republican and another 10 per cent as independent Republicans. Attachment to party, Hyman suggests, furnishes an organizing principle for the individual and gives stability to his political orientation in the confusion of changing issues.

Even in European countries, where we assume greater knowledge of issues,

[45] Angus A. Campbell, Philip Converse, Warren Miller, and Donald Stokes, *The American Voter*, New York, Wiley, 1960.

[46] Herbert H. Hyman, *Political Socialization*, Glencoe, Ill., Free Press, 1959.

[47] Angus A. Campbell, Gerald Gurin, and Warren Miller, *The Voter Decides*, Evanston, Ill., Row, Peterson, 1954.

political behavior is the symbolic expression of people's values. Members of the Labor Party in Norway, for example, are little more conversant with the stand of their party on issues than are voters in the United States. In fact, the policy of their party in international affairs and armament in recent years has been closer to the views of Conservative voters than to their own. Nevertheless, they consider themselves supporters of the party which reflects their general values.

The problem of the political leader is to make salient the cues related to political allegiance in order to arouse the voters who consider themselves party supporters to the point of expressing their attitudes by voting on election day. One technique is to increase the volume and intensity of relevant stimulation as the election approaches. If the relevant cues could be presented to each voter on election day—for example, a ballot box in his home—then the appropriate behavior would follow. But the citizen must remember on the given Tuesday that this is election day and that he must find time to go to the polls. The task of party organization is to try to remind him of this fact the weekend before, to call him that very day by phone, or even to call for him in person.

Again, two conditions are relevant in changing value-expressive attitudes:

1. Some degree of dissatisfaction with one's self-concept or its associated values is the opening wedge for fundamental change. The complacent person, smugly satisfied with all aspects of himself, is immune to attempts to change his values. Dissatisfaction with the self can result from failures or from the inadequacy of one's values in preserving a favorable image of oneself in a changing world. The man with pacifist values may have become dissatisfied with himself during a period of fascist expansion and terror. Once there is a crack in the individual's central belief systems, it can be exploited by appropriately directed influences. The techniques of brain washing employed by the Chinese Communists both on prisoners of war in Korea and in the thought reform of Chinese intellectuals were essentially procedures for changing value systems.

In the brain washing of Chinese intellectuals in the revolutionary college, the Communists took advantage of the confused identity of the student.[48] He had been both a faithful son and a rebellious reformer and perhaps even an uninvolved cynic. To make him an enthusiastic Communist the officials attempted to destroy his allegiance to his parents and to transfer his loyalty to Communist doctrines which could meet his values as a rebel. Group influences were mobilized to help bring about the change by intensifying guilt feelings and providing for atonement and redemption through the emotional catharsis of personal confession.

To convert American prisoners of war, the Communists made a careful study of the vulnerability of their victims. They found additional weaknesses through a system of informers and created new insecurities by giving the men no

[48] Robert J. Lifton, "Thought Reform of Chinese Intellectuals: A Psychiatric Evaluation," *Journal of Social Issues*, Vol. 13, No. 3, 1957, pp. 5–20.

social support for their old values.[49] They manipulated group influences to support Communist values and exploited their ability to control behavior and all punishments and rewards in the situation. The direction of all their efforts, however, was to undermine old values and to supply new ones. The degree of their success has probably been exaggerated in the public prints, but from their point of view they did achieve some genuine gains. One estimate is that some 15 per cent of the returning prisoners of war were active collaborators, another 5 per cent resisters, and some 80 per cent "neutrals." Segal, in a study of a sample of 579 of these men, found that 12 per cent had to some degree accepted Communist ideology.[50]

2. Dissatisfaction with old attitudes as inappropriate to one's values can also lead to change. In fact, people are much less likely to find their values uncongenial than they are to find some of their attitudes inappropriate to their values. The discomfort with one's old attitudes may stem from new experiences or from the suggestions of other people. Senator Vandenburg, as an enlightened conservative, changed his attitudes on foreign relations from an isolationist to an internationalist position when critical events in our history suggested change. The influences exerted upon people are often in the direction of showing the inappropriateness of their present ways of expressing their values. Union leaders attempt to show that good union men should not vote on the old personal basis of rewarding friends and punishing enemies but should instead demand party responsibility for a program. In an experiment by Stotland, Katz, and Patchen there was suggestive evidence of the readiness of subjects to change attitudes which they found inappropriate to their values.[51] Though an attempt was made to change the prejudices of the ego-defensive subjects, individuals who were not basically ego-defensive also changed. These subjects, who already approved of tolerance, apparently became aware of the inappropriateness of some of their negative evaluations of minority groups. This second factor in attitude change thus refers to the comparatively greater appropriateness of one set of means than another for confirming the individual's self-concept and realizing his central values.

We have already called attention to the role of values in the formation of attitudes in the early years of life. It is also true that attitude formation is a constant process and that influences are continually being brought to bear throughout life which suggest new attitudes as important in implementing existing values. An often-used method is to make salient some central value such as the thinking man, the man of distinction, or the virile man, and then depict a rela-

[49] Edgar H. Schein, "Reaction Patterns to Severe, Chronic Stress in American Army Prisoners of War of the Chinese," *Journal of Social Issues*, Vol. 13, No. 3, 1957, pp. 21–30.

[50] Julius Segal, "Correlates of Collaboration and Resistance Behavior among U.S. Army POW's in Korea." *Journal of Social Issues*, Vol. 13, No. 3, 1957, pp. 31–40.

[51] Stotland, Katz, and Patchen, *op. cit.*

tively new form of behavior consistent with this image. The role of motivational research in advertising is to discover the rudimentary image associated with a given product, to use this as a basis for building up the image in more glorified terms, and then to cement the association of this image with the product.

AROUSING AND CHANGING ATTITUDES
WHICH SERVE THE KNOWLEDGE FUNCTION

Attitudes acquired in the interests of the need to know are elicited by a stimulus associated with the attitude. The child who learns from his reading and from his parents that Orientals are treacherous will not have the attitude aroused unless some appropriate cue concerning the cognitive object is presented. He may even meet and interact with Orientals without identifying them as such and with no corresponding arousal of his attitude. Considerable prejudice in this sense is race-name prejudice and is only aroused when a premium is placed upon social identification. Since members of a minority group have many other memberships in common with a majority group, the latent prejudiced attitude may not necessarily be activated. Prejudice based upon ego-defensiveness, however, will result in ready identification of the disliked group.

The factors which are productive of change of attitudes of this character are inadequacies of the existing attitudes to deal with new and changing situations. The person who has been taught that Orientals are treacherous may read extended accounts of the honesty of the Chinese or may have favorable interactions with Japanese. He finds his old attitudes in conflict with new information and new experience, and proceeds to modify his beliefs. In this instance we are dealing with fictitious stereotypes which never corresponded to reality. In other cases the beliefs may have been adequate to the situation but the world has changed. Thus, some British military men formerly in favor of armaments have changed their attitude toward disarmament because of the character of nuclear weapons. The theory of cognitive consistency . . . can draw its best examples from attitudes related to the knowledge function.

Any situation, then, which is ambiguous for the individual is likely to produce attitude change. His need for cognitive structure is such that he will either modify his beliefs to impose structure or accept some new formula presented by others. He seeks a meaningful picture of his universe, and when there is ambiguity he will reach for a ready solution. Rumors abound when information is unavailable.

THE SOCIAL JUDGMENT-INVOLVEMENT APPROACH TO ATTITUDE AND ATTITUDE CHANGE

Roger E. Nebergall

I

The study of speechmaking is necessarily audience centered. Rhetorical theory has always acknowledged the importance of the audience in its formulations. This interest in the audience has inevitably focused attention on the ways audiences felt about subject matters, and the ways these feelings affected their responses to speeches. Whether so named or not, such concern is concern with what we now call attitude.

A review of what rhetorical theory has had to say about attitudes through the years would be no simple matter. The length and complexity of such a review puts it beyond the scope of this paper. In some form or another, though, critical review takes place continually as rhetoricians attempt to develop and improve the theory with which they deal. Along with such development, certain ways of thinking about attitudes are discarded, while others are retained and refined.

How and why do rhetoricians abandon one way of looking at the concept of attitudes, while retaining and refining another? Such selectivity implies certain criteria, not necessarily explicit, by which such views are evaluated. If the criteria are not explicit, of course, they may be vague and idiosyncratic. Explicit criteria, on the other hand, make evaluation easier and more consistent. Also, if it is clear *how* we evaluate, we may have a clearer notion of how to improve our understanding of a concept such as attitude.

This paper will attempt to develop two ideas or, more precisely, two parts of a single idea. First, an attempt will be made to develop explicit criteria which may be employed (and probably often *are* employed) in evaluating concepts in rhetorical theory. Second, the social judgment-involvement approach to the study of attitudes will be discussed, particularly as it relates to such criteria. The discussion will inevitably involve consideration of the fruitfulness of the approach for rhetorical theory.

In the long and richly varied history of rhetorical theory, many different, even contradictory, viewpoints have been advanced, criticized, and defended. Certain consistencies have, however, been apparent. For one thing, rhetorical theory has always been intensely practical, and ultimately has appealed to effect as an evaluative criterion. The rhetorician may ask whether discourse is beautiful, or honest, or productive of philosophic insight. However, he first inquires as to the effects of that discourse upon audiences. Criteria by which to evaluate rhetorical concepts, then, necessarily involve determinants of those effects.

The first, most necessary criterion ought to be accuracy of description. How well does the theoretical concept (in this case attitude) *describe* the phenomenon to which it refers? Using this criterion to evaluate a concept demands that accuracy of description take precedence over convenience, elegance, and simplicity. Theorists are often tempted to formulate concepts which are simple and elegant, and which seem intuitively complete and satisfying. Such criteria are not irrelevant, of course. Following accuracy of description they can be quite important. But useful description of behavior has to be phenomenological. Considerations of how people actually behave have to take precedence over considerations of theoretical elegance, the application of handy mathematical procedures, or even the ease with which experimental subjects can be located and their responses noted.

It may not be inappropriate to suggest here that the proliferation of different ideas concerning attitudes in rhetoric, *and* the relatively short terms of popularity of each different idea might be in part explained by lack of attention to such considerations.

The second criterion must be that useful descriptions are those which permit predictions about future attitudes and future behaviors. The rhetorician, bound by his commitment to the *results* of communication, necessarily demands this. He wants to know what attitudes are like. But he also has to know how likely it is that a given attitude will change, and how. He wants to know how such changes

are related to discourse. He is interested in discourse in the past that has shaped such attitudes, as well as future discourse which may modify them. Thus, the application of this criterion requires the development not only of a theory of attitude, but a theory of attitude change as well.

In summary then, these criteria require that theorizing about attitude give an accurate picture of the phenomenon in the real world, and that it do this at the expense of all other considerations. Further, such theorizing should include considerations of attitude stability and attitude change. Finally, and subordinate to the other two considerations, should be considered elegance, parsimony, simplicity, relationships to existing mathematical models, and other such considerations.

II

The social judgment-involvement approach to the study of attitudes grows out of more than thirty years of research into psychological judgment processes. This study of judgment process began with the study of the psychophysical judgment situation, and proceeded to the more complex kind of psychosocial scaling involved in attitude measurement. A complete review of this literature and, for that matter, an exhaustive review of the social judgment-involvement approach are beyond the scope of this paper. Both have been developed elsewhere.[1] In this paper some of the basic concepts in the social judgment-involvement approach will be traced out briefly so that their relationships to rhetoric and communication may be explored at greater length.

To begin with, the social judgment-involvement approach denies the adequacy of a single score as representative of an attitude. No doubt such a score can be related to an attitude, and the utilization of such a single score has proved useful in various kinds of research in the past. If we discover that the *phenomenon* attitude is too complex to be accurately represented by a single score, however, then adequate theorizing must undertake to describe that complexity.

Consider for a moment that attitudes are inferred from behavior. Consider also that the behavior is toward referents and grows out of evaluation. Such evaluation is judgment, and leads us necessarily to think of attitudes as involving a judgment process, a choosing between alternatives. The alternatives which are judged are, of course, the various possible positions on the issue at hand.

What sort of judgment is involved? What sorts of evaluations of alternative stands go into the specifications of an attitude? One such judgment would be, of course, the selection of the one stand that an individual regards as his own.

[1] See particularly Muzafer Sherif and Carolyn W. Sherif, *An Outline of Social Psychology*, Rev. ed. (New York, 1956), Chaps. 2, 3, 15, 16; Muzafer Sherif and Carl Hovland, *Social Judgment* (New Haven, 1961).

Many people would regard this selection as the most important part of an attitude or perhaps as all that is involved in attitudes. If we were to ask someone about his attitude on a social question, and if he were to choose to attempt to answer, he would almost certainly respond by identifying the stand with which he agreed, his "own" position. It is possible, though, that people who would identify the same position or alternative as their own would judge differently regarding other possible stands. If they did, then the single position which they most preferred would not reveal their attitude fully. Further, if differences in these judgments about other stands were related to the kinds of characteristic behaviors associated with attitudes, then an assessment of attitudes which did not take them into account would not predict attitude related behavior with the same precision as an assessment which did.

One such difference, which has appeared in repeated research findings, involves the positions which persons who identify the same stand as their own will identify as positions with which they also agree. The number of alternative stands other than their own with which these persons will also agree will vary. The specific stands chosen will also differ, some choosing and some not choosing to agree with a specific alternative.

Further, if persons are asked to designate the alternatives with which they disagree, they will certainly designate one or more of the alternative stands known to them as stands with which they disagree. These stands will vary, even among individuals who identify the same position as their own. Finally, these two judgment processes may not exhaust all the alternative stands. There are often other stands which an individual will not make either judgment about, but toward which he will prefer to remain noncommittal.

These alternative ways of responding contain much useful attitude information. These alternatives have been conceptualized as latitudes of acceptance, rejection, and noncommitment, respectively. It would take a far longer paper than this one to summarize the research which has established the importance of these concepts in attitude research.[2] They have been found to be stable indicators of important dimensions of attitude. More important, they have been found to provide information about attitudes not available from information about the one position which an individual regards as his own, or the single score which may represent it. Persons who would, following some procedures of attitude assessment, have the same "score" have been found to differ along such dimensions as susceptibility to attitude change, direction of change, the way in which messages are understood, and so forth. Thus, to overlook these judgments which people do make about positions on a matter other than their own is to ignore much of what we hope to learn when we investigate attitudes in the first place, i.e., the degree

[2] Much of this research is reported in Carolyn W. Sherif, Muzafer Sherif and Roger E. Nebergall, *Attitudes and Attitude Change: The Social Judgment-Involvement Approach* (Philadelphia, 1965).

to which attitudes as we study them affect behaviors in which we are interested.

In addition to the emphasis on the inadequacy of the single score to represent an attitude, the social judgment-involvement approach stresses the importance of the degree of involvement an individual has in the matter. The degree to which an individual is ego-involved in the process of judgment is a crucial factor in the kind of judgments he makes. Thus, ego-involvement is a vital difference between the process operative in psychophysical scaling (in which the anchor is a relatively neutral stimulus supplied by the experimenter) and psychosocial scaling (in which the anchor becomes the person's own position and is far, far from neutral for him).

The approach also regards as crucial the relationships between the anchor and the position being evaluated, and the influences of these relations upon the judgments being made. An assimilation-contrast phenomenon has been a consistent research finding both in earlier psychophysical research and in later research involving psychosocial scales. Briefly stated, the consistent finding is that when an object to be judged (a stand in attitude research) is relatively close to the anchor (the individual's own position in attitude research) it will be assimilated. That is, the evaluator will overestimate the extent to which the alternative is like his own position and will therefore judge it closer to his view. Similarly, if the position under consideration is relatively far from the judge's own position it will be contrasted, seen as farther away and more violently in disagreement. Such effects clearly affect latitudes of acceptance, rejection, and noncommitment, of course. They also affect the ways in which an individual with a certain attitude interprets and responds to messages he gets which are relevant to that attitude.

It would appear, then, that these considerations, to the extent that they have been and continue to be verified in a variety of research settings, provide a solid basis to argue that the social judgment-involvement approach is our best effort to date to satisfy the first criterion described above, i.e., accuracy of description. People *do* make judgments about positions other than their own. They do agree with them, disagree with them, or withhold judgment on them. People *are* ego-involved in varying degrees concerning matters on which they hold social attitudes. People *do* assimilate and contrast the positions to which they are exposed. It does not seem reasonable to develop theories of attitude which proceed as though they do not.

III

The second suggested criterion of the adequacy of a theoretical formulation about attitudes is the ability of the formulation to generate verifiable predictions. The social judgment-involvement approach should be continually tested as more

research projects undertake to utilize its formulations for predictive purposes. Several brief examples (not a full review) of research findings involving such predictions provide good early evidence of the usefulness of the approach in pre-diction.

DIRECTION OF CHANGE OF POLITICAL ATTITUDES

By employing symmetry and asymmetry of latitudes of acceptance (whether the latitudes of acceptance included the same number of positions on each side of the subject's own position or not) and the location of the one position the subject disagreed with most, 246 of 342 (72 per cent) changes in a subject's own posi-tion were predicted as to direction (either more or less favorable to one party or the other). The actual changes were obtained from data obtained in two testing sessions several days apart just before the 1960 election. Notice that the data on which these predictions are based are data which attitude measuring procedures eliciting a single attitude score do *not gather*. With only a single score available, only a random choice model, or perhaps a regression model could be employed to predict direction of change. If students of communication are interested in predicting direction of attitude change, this is an important matter. This is a pre-liminary finding, of course, but the identification of persons who identify the same position on a controversial matter as their own, but who are likely to change in opposite directions is rich in implications for the rhetorical theorist.[3]

ATTITUDE STABILITY—SUSCEPTIBILITY TO CHANGE

The student of communication is also interested in the stability of attitudes. Re-search employing a variety of attitude change measures has shown that such sta-bility is related to extremity of stand. However, the social judgment-involvement approach can serve to *specify* extremity with more precision than by the location of a response somewhere in a distribution of test scores. Specifically, the size of the latitude of noncommitment gives promise of being a measure of susceptibility to change, with a person remaining non-committal on a range of alternatives being more likely to change than a person with a narrower non-commitment range.[4]

One important exception to the generalization that the more extreme one's own position the more stable his attitude, may involve those who identify the middle or neutral position as their own. Recent research findings have shown that those whose own position is neutrality tend to divide into those who are un-

[3] Sherif, Sherif and Nebergall, pp. 178–180.
[4] *Ibid.*, 176–178.

concerned and tolerant on the one hand, and those who oppose both extremes on the other. The first are characterized by the narrow latitude of rejection and wide latitude of non-commitment characteristic of unstable attitudes, while the other shows the narrow non-commitment latitude, and wide range of rejection characteristic of those with stable attitudes, typically partisans. This may suggest a most useful way to get at the distinction many have suspected between the un-involved neutral whose neutrality shows lack of interest and the neutral whose neutrality combines indecision and preoccupation. The man who simply can't make up his mind on a matter of great importance to him may have the latter attitude structure.[5]

At the risk of belaboring the point, note that attitude measures which obtain a single score must view these types of neutrals as indistinguishable. Predictions which cannot include data as fundamental as these must continue to be unnecessarily imprecise.

SUMMARY

This paper has developed the argument that a theory of attitudes will be useful to rhetoric and communication if it is both accurately descriptive and able to make useful predictions concerning communication behavior. The social judgment-involvement approach has been briefly discussed with particular emphasis on latitudes of acceptance, rejection, and non-commitment; on ego-involvement; and on assimilation-contrast effects. The usefulness of these ideas for precise description has been developed. Finally, some specific early findings concerning prediction have been developed. Throughout the paper, the relative merit of the social judgment-involvement approach and those procedures concerned with a single attitude score has been explored.

[5] *Ibid.*, 58-59.

PROCESSES OF
OPINION CHANGE

Herbert C. Kelman

THE STUDY OF SOCIAL INFLUENCE

Social influence has been a central area of concern for experimental social psychology almost since its beginnings. Three general research traditions in this area can be distinguished: (1) the study of social influences on judgments, stemming from the earlier work on prestige suggestion; [1] (2) the study of social influences arising from small-group interaction; [2] and (3) the study of social influences arising from persuasive communications.[3] In recent years, there has been a considerable convergence between these three traditions, going hand in hand with an increased interest in developing general principles of social influence and socially induced behavior change.

[1] See, for example, S. E. Asch, *Social Psychology*, New York, Prentice-Hall, 1952.

[2] See, for example, D. Cartwright and A. Zander, editors, *Group Dynamics*, Evanston, Ill., Row, Peterson, 1953.

[3] See, for example, C. I. Hovland, I. L. Janis, and H. H. Kelley, *Communication and Persuasion*, New Haven, Yale University Press, 1953.

One result of these developments has been that many investigators found it necessary to make qualitative distinctions between different types of influence. In some cases, these distinctions arose primarily out of the observation that social influence may have qualitatively different effects, that it may produce different kinds of change. For example, under some conditions it may result in mere public conformity—in superficial changes on a verbal or overt level without accompanying changes in belief; in other situations it may result in private acceptance—in a change that is more general, more durable, more integrated with the person's own values.[4] Other investigators found it necessary to make distinctions because they observed that influence may occur for different reasons, that it may arise out of different motivations and orientations. For example, under some conditions influence may be primarily informational—the subject may conform to the influencing person or group because he views him as a source of valid information; in other situations influence may be primarily normative—the subject may conform in order to meet the positive expectations of the influencing person or group.[5]

My own work can be viewed in the general context that I have outlined here. I started out with the distinction between public conformity and private acceptance, and tried to establish some of the distinct determinants of each. I became dissatisfied with this dichotomy as I began to look at important examples of social influence that could not be encompassed by it. I was especially impressed with the accounts of ideological conversion of the "true believer" variety, and with the recent accounts of "brainwashing," particularly the Chinese Communist methods of "thought reform." [6] It is apparent that these experiences do not simply involve public conformity, but that indeed they produce a change in underlying beliefs. But it is equally apparent that they do not produce what we would usually consider private acceptance—changes that are in some sense integrated with the person's own value system and that have become independent of the external source. Rather, they seem to produce new beliefs that are isolated

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[4] See, for example, L. Festinger, "An Analysis of Compliant Behavior," in M. Sherif and M. O. Wilson, editors, *Group Relations at the Crossroads*, New York, Harper, 1953, pp. 232–256; H. C. Kelman, "Attitude Change as a Function of Response Restriction," *Human Relations*, Vol. 6, 1953, pp. 185–214; J. R. P. French, Jr., and B. Raven, "The Bases of Social Power," in D. Cartwright, editor, *Studies in Social Power*, Ann Arbor, Mich., Institute for Social Research, 1959, pp. 150–167; and Marie Jahoda, "Conformity and Independence," *Human Relations*, Vol. 12, 1959, pp. 99–120.

[5] See, for example, M. Deutsch and H. B. Gerard, "A Study of Normative and Informational Social Influence upon Individual Judgment," *Journal of Abnormal and Social Psychology*, Vol. 51, 1955, pp. 629–636; J. W. Thibaut and L. Strickland, "Psychological Set and Social Conformity," *Journal of Personality*, Vol. 25, 1956, pp. 115–129; and J. M. Jackson and H. D. Saltzstein, "The Effect of Person-Group Relationships on Conformity Processes," *Journal of Abnormal and Social Psychology*, Vol. 57, 1958, pp. 17–24.

[6] For instance, R. J. Lifton, " 'Thought Reform' of Western Civilians in Chinese Communist Prisons," *Psychiatry*, Vol. 19, 1956, pp. 173–195.

from the rest of the person's values and that are highly dependent on external support.

These considerations eventually led me to distinguish three processes of social influence, each characterized by a distinct set of antecedent and a distinct set of consequent conditions. I have called these processes *compliance*, *identification*, and *internalization*.[7]

THREE PROCESSES OF SOCIAL INFLUENCE

Compliance can be said to occur when an individual accepts influence from another person or from a group because he hopes to achieve a favorable reaction from the other. He may be interested in attaining certain specific rewards or in avoiding certain specific punishments that the influencing agent controls. For example, an individual may make a special effort to express only "correct" opinions in order to gain admission into a particular group or social set, or in order to avoid being fired from his government job. Or, the individual may be concerned with gaining approval or avoiding disapproval from the influencing agent in a more general way. For example, some individuals may compulsively try to say the expected thing in all situations and please everyone with whom they come in contact, out of a disproportionate need for favorable responses from others of a direct and immediate kind. In any event, when the individual complies, he does what the agent wants him to do—or what he thinks the agent wants him to do—because he sees this as a way of achieving a desired response from him. He does not adopt the induced behavior—for example, a particular opinion response—because he believes in its content, but because it is instrumental in the production of a satisfying social effect. What the individual learns, essentially, is to say or do the expected thing in special situations, regardless of what his private beliefs may be. Opinions adopted through compliance should be expressed only when the person's behavior is observable by the influencing agent.

Identification can be said to occur when an individual adopts behavior derived from another person or a group because this behavior is associated with a satisfying self-defining relationship to this person or group. By a self-defining relationship I mean a role relationship that forms a part of the person's self-image. Accepting influence through identification, then, is a way of establishing or maintaining the desired relationship to the other, and the self-definition that is anchored in this relationship.

The relationship that an individual tries to establish or maintain through

[7] A detailed description of these processes and the experimental work based on them will be contained in a forthcoming book, *Social Influence and Personal Belief: A Theoretical and Experimental Approach to the Study of Behavior Change,* to be published by John Wiley & Sons.

identification may take different forms. It may take the form of classical identification, that is, of a relationship in which the individual takes over all or part of the role of the influencing agent. To the extent to which such a relationship exists, the individual defines his own role in terms of the role of the other. He attempts to be like or actually to *be* the other person. By saying what the other says, doing what he does, believing what he believes, the individual maintains this relationship and the satisfying self-definition that it provides him. An influencing agent who is likely to be an attractive object for such a relationship is one who occupies a role desired by the individual—who possesses those characteristics that the individual himself lacks—such as control in a situation in which the individual is helpless, direction in a situation in which he is disoriented, or belongingness in a situation in which he is isolated.

The behavior of the brainwashed prisoner in Communist China provides one example of this type of identification. By adopting the attitudes and beliefs of the prison authorities—including *their* evaluation of *him*—he attempts to regain his identity, which has been subjected to severe threats. But this kind of identification does not occur only in such severe crisis situations. It can also be observed, for example, in the context of socialization of children, where the taking over of parental attitudes and actions is a normal, and probably essential, part of personality development. The more or less conscious efforts involved when an individual learns to play a desired occupational role and imitates an appropriate role model would also exemplify this process. Here, of course, the individual is much more selective in the attitudes and actions he takes over from the other person. What is at stake is not his basic sense of identity or the stability of his self-concept, but rather his more limited "professional identity."

The self-defining relationship that an individual tries to establish or maintain through identification may also take the form of a reciprocal role relationship—that is, of a relationship in which the roles of the two parties are defined with reference to one another. An individual may be involved in a reciprocal relationship with another specific individual, as in a friendship relationship between two people. Or he may enact a social role which is defined with reference to another (reciprocal) role, as in the relationship between patient and doctor. A reciprocal-role relationship can be maintained only if the participants have mutually shared expectations of one another's behavior. Thus, if an individual finds a particular relationship satisfying, he will tend to behave in such a way as to meet the expectations of the other. In other words, he will tend to behave in line with the requirements of this particular relationship. This should be true regardless of whether the other is watching or not: quite apart from the reactions of the other, it is important to the individual's own self-concept to meet the expectations of his friendship role, for example, or those of his occupational role.

Thus, the acceptance of influence through identification should take place

when the person sees the induced behavior as relevant to and required by a re-
ciprocal-role relationship in which he is a participant. Acceptance of influence
based on a reciprocal-role relationship is similar to that involved in classical
identification in that it is a way of establishing or maintaining a satisfying self-
defining relationship to another. The nature of the relationship differs, of course.
In one case it is a relationship of identity; in the other, one of reciprocity. In the
case of reciprocal-role relationships, the individual is not identifying with the
other in the sense of taking over *his* identity, but in the sense of empathically
reacting in terms of the other person's expectations, feelings, or needs.

Identification may also serve to maintain an individual's relationship to a
group in which his self-definition is anchored. Such a relationship may have ele-
ments of classical identification as well as of reciprocal roles: to maintain his
self-definition as a group member an individual, typically, has to model his be-
havior along particular lines and has to meet the expectations of his fellow mem-
bers. An example of identification with a group would be the member of the
Communist Party who derives strength and a sense of identity from his self-defi-
nition as part of the vanguard of the proletarian revolution and as an agent of
historical destiny. A similar process, but at a low degree of intensity, is probably
involved in many of the conventions that people acquire as part of their sociali-
zation into a particular group.

Identification is similar to compliance in that the individual does not adopt
the induced behavior because its content per se is intrinsically satisfying. Identi-
fication differs from compliance, however, in that the individual actually believes
in the opinions and actions that he adopts. The behavior is accepted both pub-
licly and privately, and its manifestation does not depend on observability by the
influencing agent. It does depend, however, on the role that an individual takes
at any given moment in time. Only when the appropriate role is activated—only
when the individual is acting within the relationship upon which the identifica-
tion is based—will the induced opinions be expressed. The individual is not pri-
marily concerned with pleasing the other, with giving him what he wants (as in
compliance), but he is concerned with meeting the other's expectations for his
own role performance. Thus, opinions adopted through identification do remain
tied to the external source and dependent on social support. They are not inte-
grated with the individual's value system, but rather tend to be isolated from the
rest of his values—to remain encapsulated.

Finally, *internalization* can be said to occur when an individual accepts in-
fluence because the induced behavior is congruent with his value system. It is the
content of the induced behavior that is intrinsically rewarding here. The in-
dividual adopts it because he finds it useful for the solution of a problem, or
because it is congenial to his own orientation, or because it is demanded by his
own values—in short, because he perceives it as inherently conducive to the

maximization of his values. The characteristics of the influencing agent do play an important role in internalization, but the crucial dimension here—as we shall see below—is the agent's credibility, that is, his relation to the content.

The most obvious examples of internalization are those that involve the evaluation and acceptance of induced behavior on rational grounds. A person may adopt the recommendations of an expert, for example, because he finds them relevant to his own problems and congruent with his own values. Typically, when internalization is involved, he will not accept these recommendations *in toto* but modify them to some degree so that they will fit his own unique situation. Or a visitor to a foreign country may be challenged by the different patterns of behavior to which he is exposed, and he may decide to adopt them (again, selectively and in modified form) because he finds them more in keeping with his own values than the patterns in his home country. I am not implying, of course, that internalization is always involved in the situations mentioned. One would speak of internalization only if acceptance of influence took the particular form that I described.

Internalization, however, does not necessarily involve the adoption of induced behavior on rational grounds. I would not want to equate internalization with rationality, even though the description of the process has decidedly rationalist overtones. For example, I would characterize as internalization the adoption of beliefs because of their congruence with a value system that is basically *irrational*. Thus, an authoritarian individual may adopt certain racist attitudes because they fit into his paranoid, irrational view of the world. Presumably, what is involved here is internalization, since it is the content of the induced behavior and its relation to the person's value system that is satisfying. Similarly, it should be noted that congruence with a person's value system does not necessarily imply logical consistency. Behavior would be congruent if, in some way or other, it fit into the person's value system, if it seemed to belong there and be demanded by it.

It follows from this conception that behavior adopted through internalization is in some way—rational or otherwise—integrated with the individual's existing values. It becomes part of a personal system, as distinguished from a system of social-role expectations. Such behavior gradually becomes independent of the external source. Its manifestation depends neither on observability by the influencing agent nor on the activation of the relevant role, but on the extent to which the underlying values have been made relevant by the issues under consideration. This does not mean that the individual will invariably express internalized opinions, regardless of the social situation. In any specific situation, he has to choose among competing values in the face of a variety of situational requirements. It does mean, however, that these opinions will at least enter into competition with other alternatives whenever they are relevant in content.

It should be stressed that the three processes are not mutually exclusive.

While they have been defined in terms of pure cases, they do not generally occur in pure form in real-life situations. The examples that have been given are, at best, situations in which a particular process predominates and determines the central features of the interaction.

ANTECEDENTS AND CONSEQUENTS
OF THE THREE PROCESSES

For each of the three processes, a distinct set of antecedents and a distinct set of consequents have been proposed. These are summarized in the table below. First, with respect to the antecedents of the three processes, it should be noted that no systematic quantitative differences between them are hypothesized. The probability of each process is presented as a function of the same three determinants: the importance of the induction for the individual's goal achievement, the power of the influencing agent, and the prepotency of the induced response. For each process, the magnitude of these determinants may vary over the entire range: each may be based on an induction with varying degrees of importance, on an influencing agent with varying degrees of power, and so on. The processes differ only in terms of the *qualitative* form that these determinants take. They differ, as can be seen in the table, in terms of the *basis* for the importance of the induction, the *source* of the influencing agent's power, and the *manner* of achieving prepotency of the induced response.

1. The processes can be distinguished in terms of the basis for the importance of the induction, that is, in terms of the nature of the motivational system that is activated in the influence situation. What is it about the influence situation that makes it important, that makes it relevant to the individual's goals? What are the primary concerns that the individual brings to the situation or that are aroused by it? The differences between the three processes in this respect are implicit in the descriptions of the processes given above: (a) To the extent that the individual is concerned—for whatever reason—with the *social effect* of his behavior, influence will tend to take the form of compliance. (b) To the extent that he is concerned with the *social anchorage* of his behavior, influence will tend to take the form of identification. (c) To the extent that he is concerned with the *value congruence* of his behavior (rational or otherwise), influence will tend to take the form of internalization.

2. A difference between the three processes in terms of the source of the influencing agent's power is hypothesized. (a) To the extent that the agent's power is based on his *means control,* influence will tend to take the form of compliance. An agent possesses means control if he is in a position to supply or withhold means needed by the individual for the achievement of his goals. The perception of means control may depend on the agent's *actual* control over specific rewards

SUMMARY OF THE DISTINCTIONS BETWEEN THE THREE PROCESSES

	Compliance	*Identification*	*Internalization*
Antecedents:			
1. Basis for the *importance of the induction*	Concern with social effect of behavior	Concern with social anchorage of behavior	Concern with value congruence of behavior
2. Source of *power of the influencing agent*	Means control	Attractiveness	Credibility
3. Manner of achieving *prepotency of the induced response*	Limitation of choice behavior	Delineation of role requirements	Reorganization of means-ends framework
Consequents:			
1. Conditions of performance of induced response	Surveillance by influencing agent	Salience of relationship to agent	Relevance of values to issue
2. Conditions of change and extinction of induced response	Changed perception of conditions for social rewards	Changed perception of conditions for satisfying self-defining relationships	Changed perception of conditions for value maximization
3. Type of behavior system in which induced response is embedded	External demands of a specific setting	Expectations defining a specific role	Person's value system

and punishments, or on his *potential* control, which would be related to his position in the social structure (his status, authority, or general prestige). (b) To the extent that the agent's power is based on his *attractiveness*, influence will tend to take the form of identification. An agent is attractive if he occupies a role which the individual himself desires [8] or if he occupies a role reciprocal to one the individual wants to establish or maintain. The term "attractiveness," as used here, does not refer to the possession of qualities that make a person likable, but rather to the possession of qualities on the part of the agent that make a continued relationship to him particularly desirable. In other words, an agent is attractive when the individual is able to derive satisfaction from a self-definition with refer-

[8] This is similar to John Whiting's conception of "Status Envy" as a basis for identification. See J. W. M. Whiting, "Sorcery, Sin, and the Superego," in M. R. Jones, editor, *Nebraska Symposium on Motivation*, Lincoln, University of Nebraska Press, 1959, pp. 174–195.

ence to him. (c) To the extent that the agent's power is based on his *credibility,* influence will tend to take the form of internalization. An agent possesses credibility if his statements are considered truthful and valid, and hence worthy of serious consideration. Hovland, Janis, and Kelley [9] distinguish two bases for credibility: expertness and trustworthiness. In other words, an agent may be perceived as possessing credibility because he is likely to *know* the truth, or because he is likely to *tell* the truth. Trustworthiness, in turn, may be related to over-all respect, likemindedness, and lack of vested interest.

3. It is proposed that the three processes differ in terms of the way in which prepotency is achieved. (a) To the extent that the induced response becomes prepotent—that is, becomes a "distinguished path" relative to alternative response possibilities—because the individual's choice behavior is limited, influence will tend to take the form of compliance. This may happen if the individual is pressured into the induced response, or if alternative responses are blocked. The induced response thus becomes prepotent because it is, essentially, the only response permitted: the individual sees himself as having no choice and as being restricted to this particular alternative. (b) To the extent that the induced response becomes prepotent because the requirements of a particular role are delineated, influence will tend to take the form of identification. This may happen if the situation is defined in terms of a particular role relationship and the demands of that role are more or less clearly specified; for instance, if this role is made especially salient and the expectations deriving from it dominate the field. Or it may happen if alternative roles are made ineffective because the situation is ambiguous and consensual validation is lacking. The induced response thus becomes prepotent because it is one of the few alternatives available to the individual: his choice behavior may be unrestricted, but his opportunity for selecting alternative responses is limited by the fact that he is operating exclusively from the point of view of a particular role system. (c) Finally, to the extent that the induced response becomes prepotent because there has been a reorganization in the individual's conception of means-ends relationships, influence will tend to take the form of internalization. This may happen if the implications of the induced response for certain important values—implications of which the individual had been unaware heretofore—are brought out, or if the advantages of the induced response as a path to the individual's goals, compared to the various alternatives that are available, are made apparent. The induced response thus becomes preponent because it has taken on a new meaning: as the relationships between various means and ends become restructured, it emerges as the preferred course of action in terms of the person's own values.

Depending, then, on the nature of these three antecedents, the influence process will take the form of compliance, identification, or internalization. Each of these corresponds to a characteristic pattern of internal responses—thoughts and

[9] *Op. cit.*, p. 21.

feelings—in which the individual engages as he accepts influence. The resulting changes will, in turn, be different for the three processes, as indicated in the second half of the table. Here, again, it is assumed that there are no systematic quantitative differences between the processes, but rather qualitative variations in the subsequent histories of behavior adopted through each process.

1. It is proposed that the processes differ in terms of the subsequent conditions under which the induced response will be performed or expressed. (a) When an individual adopts an induced response through compliance, he tends to perform it only under conditions of *surveillance* by the influencing agent. These conditions are met if the agent is physically present, or if he is likely to find out about the individual's actions. (b) When an individual adopts an induced response through identification, he tends to perform it only under conditions of *salience* of his relationship to the agent. That is, the occurrence of the behavior will depend on the extent to which the person's relationship to the agent has been engaged in the situation. Somehow this relationship has to be brought into focus and the individual has to be acting within the particular role that is involved in the identification. This does not necessarily mean, however, that he is consciously aware of the relationship; the role can be activated without such awareness. (c) When an individual adopts an induced response through internalization, he tends to perform it under conditions of *relevance of the values* that were initially involved in the influence situation. The behavior will tend to occur whenever these values are activated by the issues under consideration in a given situation, quite regardless of surveillance or salience of the influencing agent. This does not mean, of course, that the behavior will occur every time it becomes relevant. It may be out-competed by other responses in certain situations. The probability of occurrence with a given degree of issue relevance will depend on the strength of the internalized behavior.

2. It is hypothesized that responses adopted through the three processes will differ in terms of the conditions under which they will subsequently be abandoned or changed. (a) A response adopted through compliance will be abandoned if it is no longer perceived as the best path toward the attainment of social rewards. (b) A response adopted through identification will be abandoned if it is no longer perceived as the best path toward the maintenance or establishment of satisfying self-defining relationships. (c) A response adopted through internalization will be abandoned if it is no longer perceived as the best path toward the maximization of the individual's values.

3. Finally, it is hypothesized that responses adopted through the three processes will differ from each other along certain qualitative dimensions. These can best be summarized, perhaps, by referring to the type of behavior system in which the induced response is embedded. (a) Behavior adopted through compliance is part of a system of external demands that characterize a specific setting. In other words, it is part of the rules of conduct that an individual learns in

order to get along in a particular situation or series of situations. The behavior tends to be related to the person's values only in an instrumental rather than an intrinsic way. As long as opinions, for example, remain at that level, the individual will tend to regard them as not really representative of his true beliefs. (b) Behavior adopted through identification is part of a system of expectations defining a particular role—whether this is the role of the other which he is taking over, or a role reciprocal to the other's. This behavior will be regarded by the person as representing himself, and may in fact form an important aspect of himself. It will tend to be isolated, however, from the rest of the person's values and to have little interplay with them. In extreme cases, the system in which the induced response is embedded may be encapsulated and function almost like a foreign body within the person. The induced responses here will be relatively inflexible and stereotyped. (c) Behavior adopted through internalization is part of an internal system. It is fitted into the person's basic framework of values and is congruent with it. This does not imply complete consistency: the degree of consistency can vary for different individuals and different areas of behavior. It does mean, however, that there is some interplay between the new beliefs and the rest of the person's values. The new behavior can serve to modify existing beliefs and can in turn be modified by them. As a result of this interaction, behavior adopted through internalization will tend to be relatively idiosyncratic, flexible, complex, and differentiated.

THE COMMUNICATION

Arthur R. Cohen

The earliest studies of attitude and attitude change were made in the 1920's and 1930's. Investigators at that time were mainly interested in the degree to which different attitudes were held by different groups (for example, the attitudes toward the Spanish Civil War held by conservatives and liberals) and in the effects of exposure to media of communication as measured by responses to questionnaires that attempted to scale attitudes (the effects of lectures, pamphlets, and motion pictures on opinions). More recent investigators (for example, Sherif and Hovland, 1961) note that there was little concern with the psychological processes involved in the individual expression of attitudes and the pattern of stimulus conditions under which responses show change.

Since the 1930's there has been an increasing concern with the basic psychological processes underlying attitudes and their modification. The new trend got under way with the work of Hovland and his colleagues in the Information and Education Division of the War Department during World War II. Their program included a great variety of studies; of special interest here are those which employed controlled variation. These experiments were among the first to show how specific content transmitted by specific communicators affects particular audi-

ences. Let us begin by describing some of the work done in this program and then broaden our discussion by including later work which stems from the initial investigations and which bears on similar and new theoretical and empirical problems.

THE EFFECTS OF ONE-SIDED VERSUS TWO-SIDED COMMUNICATIONS

What role does the organization of arguments play in the effectiveness of a persuasive appeal? In attempting to answer this question, writers have in the past dealt with methods of refutation, problems of emphasis, number of repetitions, and so forth. One of the central problems, however, is whether it is more effective to present only one side of an issue or to present both sides. Should a communicator concentrate only on the points supporting the position he advocates or should he also discuss opposing arguments? Which strategy is the more effective?

In *Experiments on Mass Communication*, the volume in which they report the results of their wartime studies, Hovland, Lumsdaine, and Sheffield (1949) investigate whether, when the weight of evidence supports the main thesis of a communication, it is more effective to present only the materials supporting the point at issue or to introduce opposing arguments as well.

These investigators presented to two experimental groups of 214 soldiers and to a control group of 197 soldiers communications on whether there would be an early end to the war with Japan after the surrender of Germany in 1945. All of the soldiers were tested some time before the communication on their beliefs about whether Japan would surrender. One experimental group was given a fifteen-minute talk that presented only the arguments supporting the idea that the war with Japan would be a long one; the talk included much factual material stressing Japan's strength. The other experimental group was given a communication which contained the same material plus an additional four minutes of information, woven into the presentation, which stressed the United States' advantages and Japan's weaknesses.

The investigators' hypothesis was that those soldiers who were given only a one-sided argument would distrust a presentation that had failed to include opposing arguments and would be stimulated to rehearse their own position and to seek new ways of supporting it. After the presentation of the material, the soldiers were again measured on their beliefs about the probable length of the war with Japan, and a measure of change from before to after the presentation was computed. The effectiveness of the program was evaluated by comparing the average change in each of the experimental groups with the changes in a control group which had heard no communication but had merely been given the "be-

fore" and "after" attitude measures at the same time as the experimental groups.

Both experimental programs were found to be extremely effective in producing change in the men's opinions, but neither program had any advantage over the other for the audience as a whole. Depending upon the initial position of the listener, however, the net effects were different for the two ways of presenting the material. The program giving both sides was more effective for those men initially opposed to the position advocated (those who expected a short war), whereas the program giving the one-sided picture was more effective for men initially favoring the stand taken (those who expected a long war).

The investigators also expected that an obviously one-sided communication would be less effective with well-educated men and that these men would be more likely to take seriously arguments that seem to take all the factors into account. Less well-educated men, on the other hand, with undeveloped skill in critical thinking, might be more impressed with the strength of a one-sided argument, without thinking of objections. These expectations were borne out: The program which presented both sides was more effective with the better-educated men, and the program which presented one side was more effective with the less educated.

When initial position and amount of education are considered together, the two-sided communication turned out to be more effective with better-educated men, no matter what their initial position, and the one-sided presentation most effective with those less-educated men already convinced of the position advocated. Thus, to decide the most effective type of presentation requires information about the educational level of the audience and the beliefs that audience already holds.

Do these two types of communication reveal differences in resistance to counterinfluence? A further experiment (Lumsdaine and Janis, 1953) bears directly on this point. In this experiment, a week after having been exposed to either a one-sided or a two-sided communication on Russia's inability to produce atomic bombs for many years to come, half of the subjects in each experimental group were exposed to a counter-argument before being asked to state their opinions again. The counterpropaganda consisted of a playing-up and an elaboration of the arguments in the two-sided communication, as well as some new material. When the scores for change were examined, it was found that while there was no difference for those not exposed to the counterpropaganda, those who had been exposed to the counter propaganda and who had heard the two-sided program were more resistant to the counterpropaganda than those who had heard only the one-sided argument.

In summarizing the results of these two experiments, Hovland, Janis, and Kelley (1953, p. 110) conclude that a two-sided communication is more effective in the long run when, no matter what its initial opinion, the audience is exposed to subsequent counterpropaganda or when, regardless of subsequent exposure, the audience initially disagrees with the position advocated by the communicator.

The two-sided communication is less effective if the audience agrees with the initial position and is not exposed to later counterpropaganda. With respect to the second experiment, the two-sided argument apparently prepares the listener to meet counterarguments; it would thus seem especially effective in "inoculating" the listener against subsequent counterinfluence. "Inoculation" relates also to the problem of building up resistance to pressures toward attitude change. . . .

The concept of inoculation also raises questions about the way in which two-sided communications present opposing arguments. Although the investigators are most interested in resolving the issue of which type of communication is the more effective, their results make it clear that further work should take account of the manner in which opposing arguments are introduced, the character of the arguments, and the extent to which they are explicitly refuted. . . .

The foregoing conclusions about the relative effectiveness of one-sided and two-sided communications have been extended by other investigators (Thistle-thwaite and Kamenetsky, 1955). Attitude change tends to be greater for those subjects whose comprehension of the communicator's conclusion is greater or who show fewer and less intense discounting reactions to the communication. Introducing facts in support of the "other side" leads to less change of attitude when the facts are unfamiliar to the subjects, but failure to include well-known facts on the "other side" also weakens the appeal. Thus, to the degree that the facts included in the different communications are comprehensible and familiar, the appeals will be differentially effective in producing changes in attitude.

The experiments cited take little account of the fact that the persons subjected to attempts at influence are not merely members of an audience but also persons with active social lives within their social groups. Festinger (1955) has commented on the fact that knowledge about the effect of interpersonal and group processes implies that such processes may be modifying the effects obtained by one-sided versus two-sided arguments. It is possible that the two-sided presentation, by stressing the controversial aspect of the problem, may set off considerable discussion among the listeners in the week-long interval after hearing it. Thus, rather than showing the effectiveness of a one-sided versus a two-sided presentation, the results may show the resistance to counterinfluence under one set of conditions, where opinions are not anchored in a membership group, as compared to the resistance under conditions where they are firmly anchored in a membership group. . . .

THE EFFECTS OF STATING A CONCLUSION

Whether a conclusion should be stated conspicuously in a persuasive communication is a question which has long been argued by propagandists, educators, and public speakers. Is it more effective to let an audience draw its own conclusion,

or is it better to make the conclusion explicit? If we assume that indirect sugges-
tion is more effective or that decisions are more effective when reached indepen-
dently, we might expect the presentation of an implicit conclusion to be the more
powerful. But some persons, especially the less intelligent, will miss the conclu-
sion entirely if it is not stated explicitly.

Hovland and Mandell (1952) designed an experiment for studying this
problem systematically. They compared two types of communication which were
identical in every respect except one: in the first, the communicator drew the
conclusion at the end, while in the second the conclusion was left to the audience.
Under the first set of conditions, the general principles of the relevant topic (cur-
rent economic issues) were presented, together with a statement of the existing
situation (the bad financial status of the U.S.). From the principles and the state-
ment of the situation, a logical conclusion could be drawn by the individual lis-
tener (desirability of devaluation of American currency). Under the second set
of conditions, the implication and conclusion were stated explicitly by the com-
municator. The results showed that more than twice as many listeners changed
their opinions in the direction advocated by the communicator when the conclu-
sion was explicitly drawn as did when it was left to the audience.

While these results favor stating the conclusion explicitly, it does not follow
that this strategy will invariably be superior. A number of factors are involved:
the kind of communicator (whether he is trustworthy, an expert, or seen as
biased), the kind of audience (their intelligence, sophistication, types of person-
ality), the kind of issue (whether or not it is "ego-involving," how complex it
is), and the degree of explicitness with which the conclusion is actually
drawn. . . . Here we may note that later research (Thistlethwaite, de Haan, and
Kamenetsky, 1955) explores the role of intelligence in the effectiveness of stating
conclusions. Stating the conclusions in the message proves to be more effective in
changing the opinions of the less intelligent members of the audience than it does
those of the more intelligent.

In general, however, later research has been unable to confirm these earlier
findings. One set of investigators used as an issue the wisdom of the United
States in following a policy of limited war in Korea. They obtained positive re-
sults, but other investigators suggest that these results may have been due to the
fact that the measures of attitude emphasized comprehension of what the speaker
said rather than personal attitudes about the issue. These critics base this in-
terpretation on their finding that under conditions where the conclusions were
stated, the subjects showed an increase in comprehension of the material over
those where the conclusions were left implicit, but the two groups showed no
difference in agreement with the position advocated. An alternative explanation
for these conflicting results (suggested by Krech, Crutchfield, and Ballachey,
1962) is that the complexity of an issue is a central factor in the effectiveness of
stating a conclusion (Hovland et al., 1953). The issue of limited war in Korea

was one which had been widely discussed in the mass media, so that the arguments pro and con had already been spelled out for the subjects in understandable terms. By contrast, the issue of currency devaluation is a complex economic problem which most people do not understand very well.

In summary, then, we may state that persuasive communications which present a complicated and unfamiliar series of arguments on impersonal topics to less intelligent people are more effective when the conclusion is stated explicitly than when the audience is left to draw its own conclusion. There are, however, many problems that remain to be investigated before we understand fully the conditions under which explicit presentations are more effective than implicit ones in producing attitude change.

THE EFFECTS OF ORDER OF PRESENTATION

The sequence of presentation of the arguments is another important aspect of a persuasive communication. Should one start with his strongest arguments or save them until the end? Different orders of presentation in persuasive communications are discussed by Hovland, Janis, and Kelley in *Communication and Persuasion* (1953). They divide the problem into two parts: (1) When only a single side of an issue is presented, is it more effective to utilize the strongest arguments at the outset or at the end? (2) When both sides of an issue are presented successively, does the side presented first or the side presented last have the advantage?

After reviewing the evidence as to the difference between a "climax" order (important arguments reserved until the end) and an "anticlimax" order (major arguments presented at the beginning and weaker ones at the end), the investigators conclude that it is unlikely that one or the other order of presentation will invariably turn out to be superior. Rather, they feel that different external factors will produce different outcomes, and they suggest what sorts of factor will affect the outcome. Most important are attention, learning, and acceptance. They say further that the presentation of major arguments at the outset (anticlimax order) will be most effective when the audience is initially little interested in the communication, for it helps to catch attention. But when attention and motivation to learn are present, they hypothesize that the climax order will be more effective in gaining acceptance because the anticlimax order fails to fulfill the expectations created by the initial portions of the communication and may produce a letdown that promotes forgetting. Thus the advantages of one order over the other depend on the particular conditions under which the communication is presented, including the predispositions of the audience and the type of material being communicated.

Which order is the more effective when both sides of an issue are pre-

sented? This second problem of sequence is known in psychology as the "primacy-recency" question. It was first stated in its most general form as "Is there a Law of Primacy in persuasion?" An early study (Lund, 1925) made on college students, in which an instructor communicated two sides of an issue, argued for such a law. This "law" stated that the side of an issue presented first will be more persuasive than the side presented subsequently. In considering the evidence from later experiments, Hovland, Janis, and Kelley (1953) conclude that neither primacy nor recency produces consistent effects. They argue for research on the factors that contribute to the differences in results that have been obtained in the various experiments. These factors may include the complex and interacting roles of learning, attention, and acceptance, and the role of such special factors as the position of a teacher as communicator to his own students in a classroom.

Following up this line of attack, a later volume by Hovland and his colleagues (*The Order of Presentation in Persuasion,* 1957) presents replications of earlier experiments and a number of new experiments on the effects of order. Instead of attempting to confirm a general law of primacy in persuasion, they ask what conditions make either primacy or recency effective in persuasion. One set of studies tests the generality and validity of the Law of Primacy; a second deals with the effects of different sequences of appeals and arguments within a single communication.

ORDER OF SUCCESSIVE COMMUNICATIONS

The series of experiments on the effects of primacy and recency have led to the following generalizations (Hovland, 1957, pp. 130–138).

1. *The Law of Primacy is not general.* When two sides of an issue are presented successively by different communicators, the side presented first does not necessarily have the advantage. In a study by Hovland and Mandell, successive communications advocated first one and then the other side of an issue. The order of presentation was counterbalanced—half of the subjects received the "pro" arguments first and the other half the "anti" arguments first. The subjects were given opinion questionnaires after the first side had been presented and then again after the second side. The results failed to replicate the findings by Lund (1925): although some groups showed primacy effects, most groups showed recency effects. The authors speculate whether the differences between Lund's results and theirs may be due to differences in learning and acceptance. The motivation to learn the first communication may have been stronger in Lund's experimental group, and the subjects' commitment to the statement of their first opinion may have reinforced their acceptance of the first communication.

2. *Public commitment is a significant factor in the effects of primacy and recency.* If, after hearing only one side of a controversial issue, a listener makes

a response which *publicly* indicates his position on the issue, the result is a primacy effect. Without telling the subjects that they would later hear the other side of a controversial issue, the investigators presented one side and asked half of the subjects to write for publication their opinions on the issue, while the other half were asked to write their opinions anonymously. Then the other side of the issue was presented to both groups and their opinions recorded again. The investigators found that the public expression of opinion tended to fix opinions on the first side and to make the presentation of the second side less effective in changing attitudes—a primacy effect. Where there is no public commitment (as in the Hovland and Mandell study), the mere statement of one's opinion anonymously on a questionnaire after hearing only one side of an issue does not reduce the effectiveness of the second side. The experimenters believe that the effect of public commitment is due to social rewards and the need for social approval. Having placed his opinions on record, the subject feels that he cannot alter his views if he is to be regarded as consistent and honest by those with whom he expects to interact.

3. *Primacy effects may occur when one communicator presents contradictory information in a single communication, but this effect can be reduced by interpolating other activities between the two blocks of information and by warning the subjects against "the fallibility of first impressions."* In a related series of experiments, Luchins prepared two blocks of information describing the personality characteristics of a person not known to the subjects. One block contained information about an introverted person, the other block contained items characteristic of an extroverted person; for some subjects the order was introversion-extroversion and for the other half the reverse. Subjects were then asked to select adjectives reflecting their impressions, to write brief descriptions of personality, and to make predictions about the later behavior of the person they had read about. The material presented first proved to be considerably more influential in determining what the subjects thought to be the chief characteristics of the person described. When subjects in a comparable experiment were forewarned about the possible fallibility of first impressions before any information was presented, however, the second block of information tended to exert a relatively greater influence than the first on the final impressions formed. Recency was most effective in the group that was forewarned, next most effective in another group in which the warning was interpolated between the first and second blocks of information, and weakest in a third group for whom arithmetic tasks were interpolated between the two blocks of information. In all three groups, however, the recency effect was stronger than primacy effect.

ORDER WITHIN A COMMUNICATION

What is the best way to organize the material when a complex argument for one side of an issue is to be presented? For example, should you begin with

those arguments which favor your side of the issue and then refute the opposing arguments, or should you take care of the opposition first?

1. *If a communicator first arouses the subject's needs and then presents information that tends to satisfy those needs, the information will be accepted more readily than if the arousal of need follows the presentation of the information.* An experiment by Cohen compared two situations: one, presenting to college students a threatening communication about problems of grading and necessary reforms, was followed by the information that grading "on the curve" would solve the current situation; the other reversed the order of the presentation of the threat and the information about grading on the curve. Attitudes toward grading on the curve were measured before and immediately after the experimental introduction of the threat and the information, and then again three months later. It was found that the first sequence (need-information) was more effective, probably because the second order (information-need) did not make much sense to the subjects. Information presented after a need is aroused can operate in a direct fashion; less effort is required on the part of the listener to see it as relevant to his needs. Those who receive the information first do not see the point of the information as they are getting it. They see its relevance only afterward, and by then they may already have lost much of it because they have not been paying close attention; in any case, they now have the job of reconstructing what they have heard in a manner relevant to their needs.

2. *Attitudes change more when communications highly desirable to the subject are presented first, followed by the less desirable ones, than when the less desirable ones come first.* McGuire found that the communicator elicited more agreement with his views when his earlier communications were rewarding for the subject. McGuire's hypothesis is that, with this sequence, the subject starts out by becoming progressively more responsive to the communicator in terms of paying attention and being willing to learn; later the communicator capitalizes on these responses in the less rewarding part of the message. On the other hand, the communicator who first presents undesirable content to the recipient excites responses leading to nonacceptance (withdrawing attention) because agreeing with these undesirable issues is unpleasant; by the time he gets to the rewarding part of his message he has lost the subject's attention.

3. *The "pro-con" order is superior to the "con-pro" order when an authoritative communicator plans to mention "pro" arguments and also nonsalient "con" arguments.* This generalization comes from an experiment by Janis and Feierabend. One experimental group received a version of a pamphlet on civil defense in which the arguments for civil defense were presented first, followed by the arguments against it; the other group received a version which reversed the order. To gauge the relative effectiveness of the two forms of the communication, the subjects were given a postcommunication questionnaire on their willingness to volunteer for civil defense. The data showed that the group which received the

"pro" arguments first found the communication more persuasive than did those who received the "con" attitudes first: they were more ready to volunteer for civil defense. Janis and Feierabend interpret their results as an example of the resolution of an approach-avoidance conflict: arguments in favor of a position agreed with initially strengthen the approach tendency, and arguments against the position, provided they are not too strong, can then be handled without causing a reversal of the initially favorable attitude.

More recent research by Miller and Campbell (1959) and Anderson and Barrios (1961) is also relevant to the problem of order effects. Miller and Campbell call attention to the fact that the rate of forgetting diminishes over time; we forget most rapidly immediately after learning, and in successive equal time intervals we forget proportionately less and less of what is left. Thus, of two associations equally strong at a given moment, the older will decay less rapidly. From the properties of the curve of forgetting, certain predictions can be made and tested.

Miller and Campbell varied the order in which they presented opposing arguments (pro-con, con-pro) to college students. The communications were on an issue about which the subjects had little prior information and had formed no opinions (a trial involving a suit for damages), so that there was little contamination from previous learning, a condition not generally met in the earlier two-sided studies. In addition to varying the order, the investigators varied both the time interval between the opposing arguments (none and one week) and the time of testing the effect of the arguments (immediately after the second argument and one week later). The measure of attitude toward the defendant's case (the "con" side) and toward the plaintiff's (the "pro" side) also showed a significant recency effect, no matter which information was presented first, under the conditions most favorable to the emergence of a recency effect as predicted from the curve of forgetting. The last-heard argument is most effective when there is a long delay between the first and second communications (with maximal loss of memory for the first) coupled with an immediate measurement after the second communication (with minimal loss of memory for the second). The last-heard argument is least effective when the two presentations are contiguous (so that the temporal advantage for the second is minimal) and the testing is delayed (so that the relative lapses of time since the initial exposures become more and more nearly equal). On the basis of the learning curve, however, one would not expect that the first-heard argument would have the advantage even under the latter conditions, which are those least unfavorable to it. Nevertheless, under these conditions the first-heard argument turns out to be the stronger one. In other words, there is a primacy effect when it is given a chance to show itself.

Miller and Campbell point out that most of the earlier experimental studies involved conditions of contiguous presentation and immediate testing. Immediate testing is a condition in which the relative time lapse is at its greatest for the

first-heard argument, so that any primacy effect there may be is canceled out by the time-advantage given to the second argument. The reader familiar with the relative effects of what are known in the general psychology of memory and forgetting as retroactive and proactive inhibition will realize that from the point of view of these effects the first-heard argument is probably under the greatest disadvantage when the presentations are contiguous. It is not surprising, therefore, that different experiments have shown inconsistent results (Hovland, 1957). Miller and Campbell (1959) conclude that the evidence cited by Hovland and his colleagues could be interpreted as consistent with an ever-present primacy effect, though the strength of this effect would necessarily vary with the experimental conditions peculiar to each of the studies and would frequently be masked by a recency effect.

Anderson and Barrios (1961) raise an interesting issue: what happens when a subject receives a series of communications on a variety of topics from the same source, each communication being divisible into "pro" and "con" segments? Although the primacy effects are striking at first, they diminish as the series of communications progresses. The investigators point out that there are several possible explanations for this result. For one thing, the particular pattern of good and bad adjectives used in the later sets may have stimulated an increased tendency to take account of all the words in each set. Also, a progressive loss of interest in the task might decrease the primacy effect. Finally, the subjects may simply become more skillful in handling the total communication as a single integrated unit, so that the primacy-recency distinction is less relevant. In any case, it is clear that it is not safe to generalize to situations involving many communications from the results of studies which employ only one or two communications.

Taken as a whole, the findings regarding primacy and recency (see also Lana, 1961) seem to rule out any universal principle of primacy in persuasion, but they have led to specifications of some of the sets of conditions which affect primacy. These factors include time of measurement, similarity of issues, contiguity of presentation, number of separate issues, earlier positive experiences with the communicator, interpolated activity, warnings against premature commitment, encouragement toward commitment, ambiguity inherent in the sequence of communications, and arousal of needs before proffering information. The effects of these factors are not due in any simple manner to learning or memory of evidence or arguments or to such factors as set, reinforcement, or attention. If anything, factors of acceptance may be the most critical. Thus, coming first makes a statement no more likely to be remembered, but does make it more likely to be believed; one side of an argument tends to be persuasive provided we have not heard the other side, and hearing one side after we have heard the other makes us more critical and skeptical.

As is true for the entire area of persuasive communication and attitude

change, future study of the order of presentation should be based on the development of more elaborate theoretical models which take into account the laws of learning, perception, and motivation and on the conducting of crucial experiments which pit one theoretical approach against another. By invoking different theoretical formulations, we uncover sets of considerations which might never emerge as factors affecting the order of presentation if we relied on only one theoretical system.

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PART V
COMMUNICATION THEORY: SOCIAL CONTEXT

The processes of human communication cannot be explained apart from social context. Communication does not occur in a sociocultural vacuum; it is not a "pure" process, without context or background. Every social situation forms a pattern, a context, that governs the ongoing flow and effects of interpersonal behavior. In the literature on communication theory, the notion of social context refers to forces influencing communication in an immediate, specific setting and to those forces that govern the flow of information and patterns of influence from reference group to reference group.

The first three essays in this section are similar insofar as each deals with influences operating in an immediate social situation. In "How People Interact in Conferences," Robert F. Bales underscores the importance of situational factors as they impinge upon the interaction patterns of small groups. Bales relies upon data gained from content analysis in tracing the importance of such situational factors as time, initial consensus, error-checking, rate of exchange, and group climate.

Other factors, of course, also define social context. Joseph E. McGrath in "Group Composition and Structure" shows how differences in group outcomes are due largely to divergencies in individual abilities and the dimensions of work structure, power structure, communication structure and friendship structure. The composition and structure of a group does not, of course, always lead

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to decision making. Dorwin Cartwright in "Achieving Change in People: Some Applications of Group Dynamics Theory" discusses such factors as group attraction, attitudes, prestige, norms, similarity of group perceptions, openness of communication, and tension as determinants of the ability of a group to render decisions and to make changes in the beliefs and attitudes of their members.

In the flow of information from one group setting to another, people are linked in an assortment of interconnected networks and alliances. Elihu Katz and Paul Lazarsfeld in "Interpersonal Networks: Communicating Within the Group" discuss some situational influences upon group interaction. They review research evidence of the salience of interpersonal relationships in affecting the communication patterns from one group to other social settings.

In the final essay, "Traditions of Research on the Diffusion of Innovation," Elihu Katz, Martin L. Levin and Herbert Hamilton examine the on-going flow of communication from within the broad perspective of *diffusion*. The authors define diffusion as the acceptance of a specific idea, over time, by individuals, groups, or other adopting units, linked together by a channel of communication to a social structure and in turn to a given system of values or culture. The elements of this definition provide a theoretical basis for reviewing the major mechanisms of social and technical change through communication.

HOW PEOPLE INTERACT
IN CONFERENCES

Robert F. Bales

Social interaction is made up largely of the talking that people do when they get together. Talk is an elusive object of study, in spite of the fact that a good deal of it exists. It is also a rather sensitive subject. Even a friend might find it hard to put up with a dissection of the following kind: "I was just noticing how much you talk. In the last 10 minutes I noticed that you made a total of 114 remarks, while I made a total of 86. According to my count you gave about twice as many opinions as facts. Although I agreed with you 15 times and didn't disagree at all, I noticed that you stammered once and blushed twice."

I first began to develop a systematic procedure for analyzing social interaction when I became interested in trying to account for the success of Alcoholics Anonymous in helping apparently hopeless drinkers to stop drinking. Although I attended meetings and talked with many members, I did not feel free to ask all the questions I wished. Consequently I fell back on observation and began to develop crude methods for recording who did what, who spoke to whom, and how. Eventually even this quiet occupation began to appear sinister and the effort was

abandoned. But by this time my fascination with the process of social interaction had developed to the point of no return. I decided that I must pursue my studies in the more favorable conditions of a laboratory.

A number of laboratories for the study of social interaction within small groups and organizations have been started in the last 10 years—in hospitals, clinics, special research centers and military installations. The studies and experiments I shall describe were conducted in one of the earliest of these laboratories, established in 1947 at Harvard University.

The laboratory consists of a large, well-lighted room for the group under study and an adjoining room for observers, who listen and watch from behind windows with one-way vision. The subjects are told at the beginning that the room has been constructed for the special purpose of studying group discussion, that a complete sound recording will be made and that there are observers behind the one-way mirrors. The purpose of the separation is not to deceive the subjects but to minimize interaction between them and the observing team.

After much research we developed a standardized task from which significant generalizations could be drawn. A group of persons (ranging from two to seven in number) is asked to discuss a complex human relations problem of the sort typically faced by an administrator. Each member of the group first reads a five-page presentation of facts about the case to be discussed, but each is left uncertain as to whether he has been given exactly the same range of facts as the others in the group. The members are not introduced to one another or coached in any way; they must develop their own organization and procedure. They are to consider the facts and report to an administrator, as if they were his staff, their joint conclusions concerning the problem and what should be done about it. They are allowed 40 minutes for the discussion. The group is observed for four such sessions.

On the other side of the one-way screen the observers systematically record every step of the interaction, not omitting such items as nods and frowns. Each observer has a small machine with a moving paper tape on which he writes in code a description of every act—an act being defined essentially as a single statement, question or gesture. Acts ordinarily occur at the rate of 15 to 20 per minute. The recorded information on each includes identification of the person speaking and the person spoken to and classification of the act according to predetermined categories. There are 12 categories, covering positive and negative reactions, questions and attempts to solve the problem by the offering of information, opinion or suggestions.

As this table shows, on the average about half (56 per cent) of the acts during a group session fall into the categories of problem-solving attempts; the remaining 44 per cent are distributed among positive reactions, negative reactions and questions. In other words, the process tends to be two-sided, with the reac-

	Percent
Shows solidarity	3.4
Shows tension release	6.0
Shows agreement	16.5
Gives suggestion	8.0
Gives opinion	30.1
Gives information	17.9
Asks for information	3.5
Asks for opinion	2.4
Asks for suggestion	1.1
Shows disagreement	7.8
Shows tension	2.7
Shows antagonism	.7
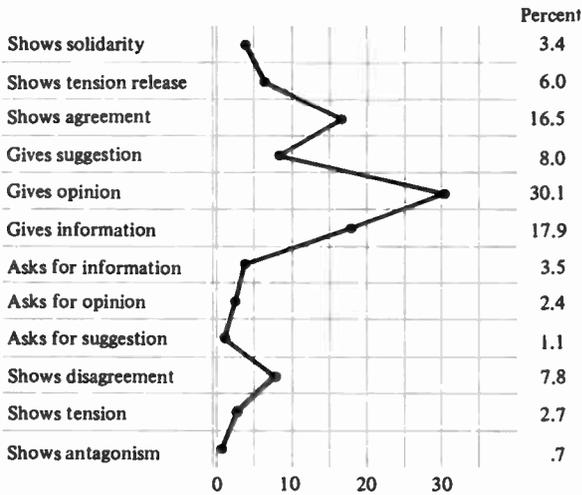
TYPES OF ACTS in social interaction may be classed in four main categories: positive reactions, problem-solving attempts, questions, and negative reactions. The averages for 96 group sessions show that 56 percent of the acts fall into the problem-solving category.

	Percent	
Shows solidarity	3.8	4.1
Shows tension release	1.6	8.0
Shows agreement	2.0	26.3
Gives suggestion	10.0	5.9
Gives opinion	39.5	22.3
Gives information	31.4	15.4
Asks for information	3.4	3.4
Asks for opinion	3.4	2.1
Asks for suggestion	1.4	.9
Shows disagreement	1.4	8.7
Shows tension	1.4	1.8
Shows antagonism	.7	1.1
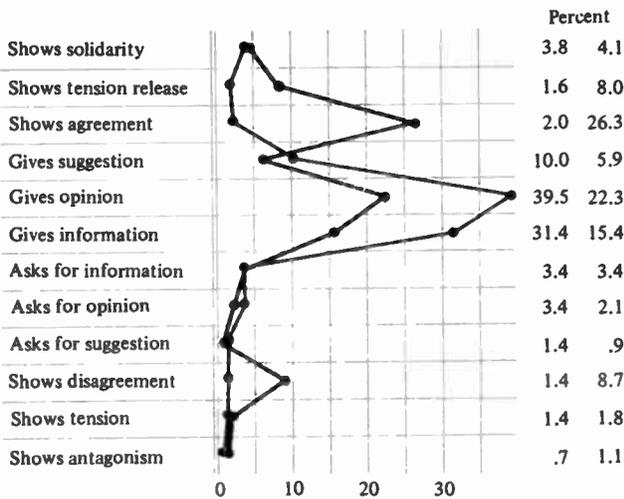
PATTERN OF ACTION of individuals in a discussion is illustrated statistically. When a member takes the floor, his first remark (*dotted curve*) is likely to be a reaction to the preceding speaker. His next remarks (*solid curve*) tend to be problem-solving attempts.

tions acting as a more or less constant feedback on the acceptability of the prob-
lem-solving attempts. The following is a typical example of the pattern of inter-
change:

> Member 1: "I wonder if we have the same facts about the problem? [Asks for opinion.]
> Perhaps we should take some time in the beginning to find out." [Gives suggestion.]
> Member 2: "Yes. [Agrees.] We may be able to fill in some gaps in our information.
> [Gives opinion.] Let's go around the table and each tell what the report said in his case."
> [Gives suggestion.]

This example illustrates that a speaker's first remark is likely to be a reac-
tion, and if he continues speaking, the probability is very high that his second
act will be a problem-solving attempt. The lower chart on the opposite page sums
up this finding statistically: about 50 per cent of the time a member's first re-
mark in a series is a reaction; if he continues, about 80 per cent of the succeed-
ing comments are opinions or other offerings classed as attempts to solve the
problem.

When we examine the reactions, we find that positive reactions commonly
outnumber negative ones about two to one during a session. It is as if after every
negative reaction, the members of the group feel they must make another prob-
lem-solving attempt which meets with a positive reaction "just to catch up," and
net forward progress is felt to be sufficiently secure only when a repetition of the
problem-solving attempt meets unopposed acceptance. It may be that members
employ repetition, or near repetition, as an error-checking device to determine
whether the others "really agree." Social interaction, in common with many
other goal-seeking control mechanisms, seems to depend upon error and correc-
tion of error for guidance.

The process of attempting to arrive at a group decision through discussion
is in many ways very like the operation of a large-scale communication and con-
trol system such as an air-defense network. I recently compared the two processes
in collaboration with John Kennedy of the Systems Research Laboratory at the
Rand Corporation.

In the military case there are three functions to be performed: surveillance
of the air by radar, identification of planes as friendly or unknown and direction
of fighters sent out to intercept unknown planes. These are something like the
three problems confronting our groups in the standard interaction task: assem-
bling the given information on the case, evaluating it and proceeding toward a
solution as the goal. Now the stepwise operations involved in the air-defense sys-
tem may be tolerably well described as an interlocking series of seven types of in-
formation-processing operations. Here x stands for the path of a plane tracked by
radar, and O represents the class of objects unknown. If no known flight plan of
a friendly plane coincides with x—a fact represented by the symbol y—then x

1 States primary observation: I observe a particular event, X.	
2 Makes tentative induction: This particular event, X, may belong to the general class of object, O.	
3 Deduces conditional prediction: If this particular event, X, does belong to the general class, O, then it should be found associated with another particular event, Y.	
4 States observation of check fact: I observe the predicted particular event, Y.	
5 Identifies object as member of a class: I therefore identify X-Y as an object which is a member of the predicted general class of objects, O.	
6 States major premise relating classes of objects: All members of the general class of objects, O, should be treated by ways of the general class, W.	
7 Proposes specific action: This particular object, X-Y, should therefore be treated in a particular way, W.	
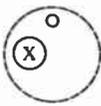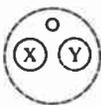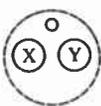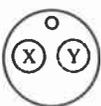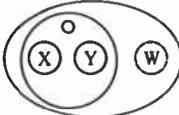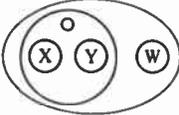
PROCESS IN REACHING A GROUP DECISION is analogous to the operation of a large-scale communication and control system such as the air-defense network. The steps consist of observing an object or event, comparing it with several possible identifications, considering the associated facts and, once its nature is understood, taking the appropriate action.

must belong to the class *O*. Since there is a general rule, *W*, that all unknown planes are to be intercepted, the conclusion is that a specific order, *w*, should be given to intercept *x*.

Such a decision, involving many groups and interlocking processes, is obviously a very complicated affair, socially as well as technically. The job of the

decision-making organization is essentially to build and maintain through means of communication and evaluation a sufficiently complex and commonly accepted symbolic structure to guide or control the stages of behavior of all the operating units. Effective decision making is basically a continuous process of building and maintaining a structure of cultural objects which in their totality constitute the common culture of the organization affected.

The seven types of acts, or stages, just described are very general: they apply quite as well to the interaction of five experimental subjects in the laboratory group, trying to decide in 40 minutes what the administrator in their case should do about his problem, as to the large-scale operations of an air-defense network. Not all of the elements in the process are primarily logical in character. They involve elements of perception, memory, association and perhaps inductive insight. All sorts of motivational and evaluative pressures affect the process. The steps make sense not as a formally perfect chain of logic, but rather as a set of symbol transformations which help to guide, although in an imperfect way, a process of decision-making behavior. Error checking is an integral part of this fallible process.

The reason for calling attention to the seven-step structure of the process is that it may help to explain the unequal ratios of suggestions, opinions and information offered in the problem-solving attempts of the groups in our tests. As the first table shows, of every seven problem-solving attempts, on the average four are opinions, two are offers of information and one is a suggestion. It seems significant that in the idealized seven-step outline of the air-defense operation two steps have the interaction form of giving information, four intermediate steps have the interaction form of giving opinion and only one step, the final one, has the form of giving a suggestion.

From the transcription of a group discussion it is often possible to reconstruct complete seven-step chains leading to agreement on specific points and the final conclusion. In a general way there is even a tendency for the steps to proceed in a regular order in time. During a session the rates of giving information tend to be highest in the first third of the meeting and to decline in the next two thirds. Rates of giving opinion are usually highest in the middle portion of the meeting. Rates of giving suggestion are generally low in the early period and reach their high point in the last third of the meeting.

Rates of both positive and negative reactions tend to rise from the first third of the meeting to the last third. These increases may be connected mainly with social and emotional problems of the group process itself. The ratio of negative to positive reactions tends to be higher in response to suggestions than in response to factual statements. The decision point is a critical bottleneck in the process. Once the decision point has been passed, however, the rates of negative reaction usually fall off and the rates of positive reaction rise sharply. Joking and laughter, indicating solidarity and tension release, become more frequent. With
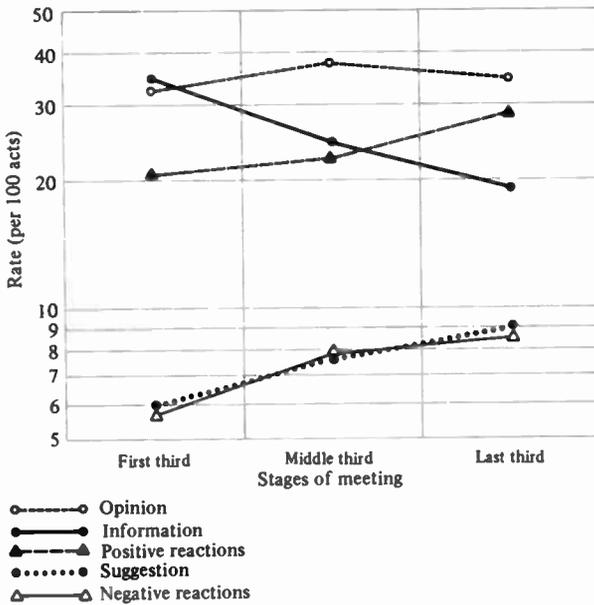
GROUP PROCESS toward a decision is characterized by a change in the frequency of different types of social acts as the meeting wears on. Information-giving decreases while suggestions and positive and negative reactions increase.

the problems of the task and common values stabilized for the time being by the decision, the interaction process apparently turns to restabilizing the emotional states of the individuals and their social relations to one another.

There is a good deal of evidence that the process of social interaction, like other processes involving feedback, tends to fall into oscillation as it "hunts" around a hypothetical steady state. Over a small time span the action tends to alternate every few acts between the problem-solving attempts of one person and the social-emotional reaction of some other. But this rapid oscillation is not quite rapid enough to keep all elements of the process in perfect balance. There is a drift toward inequality of participation, which in time has cumulative effects on the social relationships of the members. The reason for this drift may be seen fairly easily. When a person has completed one act, the chances are a little better than even that he will continue for another act. After each succeeding act his probability of continuing drops, but never as far as if he simply flipped a coin at each point to determine whether to continue or to yield the floor. In fact, relatively speaking, he exceeds this chance probability by a larger and larger fraction with each succeeding act.

We have already noted that when a person continues several acts in succession the probability is very high that he is giving information, opinion or sugges-

tion—in other words, specializing in problem-solving attempts. We may also
infer from the seven-step theory of problem-solving attempts that the tendency to
continue for several acts in succession is probably due in part to a felt need on
the part of the speaker to provide inferences and check facts which will result in
the acceptance of a more advanced step in the series, with an accepted suggestion
as the goal.

This tendency toward inequality of participation over the short run has cu-
mulative side effects on the social organization of the group. The man who gets
his speech in first begins to build a reputation. Success in obtaining acceptance
of problem-solving attempts seems to lead the successful person to do more of the
same, with the result that eventually the members come to assume a rank order
by task ability. In some groups the members reach a high degree of consensus on
their ranking of "who had the best ideas." (The members are interviewed by
questionnaire after each meeting.) Usually the persons so ranked also did the
most talking and had higher than average rates of giving suggestions and opin-
ion.

While one person becomes a specialist in advancing ideas, another is apt to
be developing a specialization on the reactive side. The men most commonly
rated "best liked" typically have higher than average rates of showing tension re-
lease (mainly smiling and laughing) and showing agreement. It is not impossible
for the man ranked at the top in ideas also to be best liked, but apparently it is
difficult. In one set of experiments the top idea man had about an even chance of
also being best liked at the end of the first meeting, but by the end of the fourth
meeting his chances were only about one in 10. The best-liked man is usually sec-
ond or third in the participation hierarchy.

The task specialist seems to "lock onto" the person who is most responsive
to what he is saying and address more remarks to him than to the others. In
turn, the best-liked man talks more and agrees more with the top-ranking idea
specialist than with any other member. The idea specialist and the best-liked man
often form a mutually supporting pair. However, the best-liked man may attract
the idea specialist even though they are not always in agreement. Indeed, in
order for a person to become established in the minds of other members as a so-
cial-emotional specialist, it is probably more important that he be representative
of their reactions, both positive and negative, than that he should ardently sup-
port everything the task specialist says. Apparently reactions that are emotionally
gratifying to other members tend to be generalized by them into liking for the
person who expresses the reactions.

Giving suggestions, necessary as it may be for accomplishment of the task,
is more likely to arouse negative reactions than is giving information or opin-
ions. This tends to put the task specialist in a vulnerable posititon. The group
commonly develops a certain amount of negative feeling toward him. Not only is

he likely to lose the status of being best liked, but he may lose his position as task leader unless he is sensitive to the problem and is well supported by other members. Even in a group which ends its first meeting with a high consensus on who has the best ideas, the second meeting is apt to see a challenge to his leadership, with a rise in rates of disagreement and antagonism and a precipitous drop in his popularity. But then, in a group where the original consensus was high, a peculiar thing seems to happen. Apparently as progress toward accomplishment of the task slows down, some members rally around the leader again and his popularity tends to rise. By the third meeting the rates of disagreement and antagonism go down. The task leader may not retain all the liking that was transferred to him in his time of need, but the net effect of the hunting kind of oscillation that takes place is a tendency to maintain the original rank order of task ability.

In a group that starts with a low degree of consensus on who has the best ideas, the developments usually are more dismal. There tends to be a high turnover in the top ranks throughout the four meetings, with one would-be leader replacing another. In such a group the man ranked as having the best ideas is less apt to be best liked. Furthermore an additional specialist is likely to appear—a man who talks more than anybody else but is neither best liked nor most highly respected for his task ability.

It appears probable that whether the members will agree on who has the best ideas depends to a large degree on how well they agree on basic premises or norms—what we may call the "common culture." If such consensus is not present, at least implicitly, at the beginning, it may take a long time to build. While consensus on major values does not solve all the problems of arriving at a stable social organization, probably no stable organization is possible without this control factor. If it is lacking, the interaction process becomes primarily a means for the expression of individual emotional states.

Our studies have made clear that social stability is an extremely complex achievement: it takes time and patience to arrive at a common culture extensive enough and sensitive enough to regulate strong counter motives, to promote task accomplishment, to harmonize social relationships and to rejuvenate itself whenever the conditions demand. A clear recognition of the complexity of cultural control of behavior should encourage us to believe that interminable series of meetings around the conference table, international and otherwise, are perhaps worth while after all.

GROUP COMPOSITION AND STRUCTURE

Joseph E. McGrath

In this . . . [paper] we will consider differences in group composition and structure and the effects of these differences on the group and its members.

Group composition refers to the properties represented by the aggregate of persons who are the members of a given group at a given time. We can consider group composition with respect to any of the many variables in terms of which we can characterize individuals: abilities, attitudes, personality characteristics, or personal attributes such as age, sex, educational background, and others.

Group structure refers to the relatively stable patterns of relationships that exist among members of groups. As the term is used here, all groups can be described in terms of many aspects of their structure, even groups of relatively short duration. Group structure, like "personality," is not something that different groups have or do not have, or that different groups have more or less of. Rather, groups differ in the kind or form of structure they have, just as individuals may differ in the kind or form of personality structure by which they can be characterized.

If we define groups as sets of interlocked roles, we cannot merely list a set of roles that form the "parts" for all groups. Rather, each group or type of group is likely to have a different set of particular roles. We can specify much of the role structure of a family in terms of the position and roles of father-husband, mother-wife, son-brother, and daughter-sister. These particular role relationships would be meaningless for describing the role structure of a work group or of an athletic team. It is possible, however, to describe at least three major dimensions in terms of which *any* set of roles may be *differentiated from* one another and *related to* one another. For each dimension, if we focus on the individual role as it is related to other roles, we are dealing with basic properties of roles; while if we focus on the total pattern of relationships among roles, we are dealing with different forms of group structure. The three dimensions of role relationships are:

1. Role differences in terms of task activities or responsibilities: the *work structure*
2. Role differences in terms of authority or influence: the *power structure*
3. Role differences in terms of communication channels: the *communication structure*

One further dimension of group structure has to do with relations among members, rather than among roles:

4. The pattern of affect relations among members: the *friendship structure*

Before we consider these patterns of group structure, we will discuss group composition, that is, the sets of abilities, attitudes, and other properties members bring with them to the group.

COMPOSITION OF THE GROUP

What a group is and what it does depends in part on characteristics of its members, independent of the role structure of the group. For example, a group of men with high ability can certainly do a task better than a group with lower ability. It does not always follow, however, that the group with higher ability will do the task better. If the task does not demand much skill, the additional ability of the better group will be superfluous and might even be detrimental if the task were so easy and unchallenging that the group had little motivation to perform it. Thus, a group does not necessarily need the *highest possible* levels of ability in all members. What it needs is a *distribution* of levels and types of abilities which best fits the requirements of its task.

Furthermore, the task, power, or communication structure of a group may

operate to prevent the effective utilization of abilities of members. Torrance (1954) found that the effectiveness of group actions in a new and ambiguous situation (a physical-survival situation) was influenced adversely for groups whose prior power structure (the formal rank structure of air crews) remained unaltered. The formal structure of the crew, designed to perform a different task, tended to prevent the utilization of skills and resources of members who were low in that formal structure but had high levels of skills relevant to the new situation. Fiedler and Meuwese (1963) found evidence that the utilization of member abilities depends on the type of formal leader and his style of leadership. Several studies of groups with restricted communication structures, which will be discussed later in this chapter, indicate that the degree to which the group gets the benefit of the skills of a particular member depends on the position of that member (how central he is) in the communication structure. Thus, while it is probably true that when all other things are equal groups of more able men perform tasks better than groups of less able men, there are many factors besides the task skills of members which affect group performance.

A group's effectiveness depends also on the *personalities* of its members. But just what kinds of personalities make for good groups? "Folklore" on this question supports either one of two opposite premises: (1) that persons with *similar* personalities make good groups, as in "Birds of a feather flock together"; or (2) that persons with *different* personalities make good groups, as in "Opposites attract." Recently, Schutz (1958) tested the hypothesis that persons with *different but complementary* patterns on certain personality characteristics are most compatible, hence make the most effective groups. He combined pairs of people in terms of the strength of their needs to give and to receive inclusion (belongingness), control, and affection. The compatible pairs were those in which member A had a high need to give inclusion, control, and/or affection to others, while member B had a high need to receive inclusion, control, and/or affection. He compared such compatible groups with pairs in which the two members had similar patterns of these needs (for example, both members had high needs to give affection or inclusion or control), and with other pairs whose members had different but noncomplementary patterns of needs (e.g., member A had a high need to give control while member B had a high need to receive affection). He found the compatible pairs to be more effective on relatively complex group problem-solving tasks, although the different types of groups were about equal on easy tasks.

Other research on homogeneity of personality does not provide a very clear picture. Cohen (1956) studied the performance of two-person groups whose members were either similar or dissimilar in their preferred defense mechanism (projection, aggression, repression, and so on). He found that groups in which both members tended to use projection as a preferred defense mechanism performed less effectively, but he did not find any consistent differences for groups

that were either similar or dissimilar in the use of other defense mechanisms. Haythorn *et al.* (1956) and Altman and McGinnies (1960) found that there was less intragroup hostility in groups whose members were homogeneous in attitudes toward authority. On the other hand, Hoffman (1959) has shown that task performance was better for groups whose members were heterogeneous in overall personality patterns.

The conflicting evidence makes it probable that neither homogeneity nor heterogeneity of members per se is desirable. Rather, it is likely that homogeneity on some characteristics and heterogeneity on others make for effective groups. Homogeneity on certain personality characteristics such as dominance or the use of projection will almost certainly be disruptive in a group; homogeneity on other characteristics, such as sociability, may lead to greater member satisfactions and smoother cooperation on the task. Homogeneity or heterogeneity on other personality variables may make no difference at all.

Regarding member abilities, performance is likely to be better if a group has a heterogeneity of skills, or at least a distribution of skills that is of sufficient range to deal with all required tasks, than if it has a narrower range of skills common to all members. On the other hand, groups whose members have similar backgrounds and hence similar attitudes and values are likely to have better communication and better affect relations. For example, Fiedler, Meuwese, and Oonk (1961) found less friction and better performance in groups homogeneous in religious background. Here again, however, there are probably many specific background factors and attitudes for which the degree of member homogeneity or heterogeneity does not matter.

Another crucial aspect of group composition has to do with the level and diversity of the *motivations* of group members. Groups differ from one another in terms of how strongly motivated their members are, collectively, with respect to attaining the group's goals. Furthermore, it is unlikely that all members of any given group will be equally strongly motivated toward achievement of the group's goals. Both levels of over-all member motivation and differences in intensity of motivation among group members will affect how well the group can accomplish its objectives. As with levels of ability, adequate levels of motivation of group members are a necessary but not a sufficient condition for group success. A poorly motivated group will almost certainly not be highly successful on relatively difficult tasks. A highly motivated group, however, may or may not be successful, depending on the level and distribution of member abilities, the pattern of member personality characteristics, and whether the group's task, power, communication, and friendship structures aid or hinder task performance.

Perhaps a more crucial aspect of group-member motivation has to do with whether or not group members are motivated toward group goals rather than individual goals. In any group situation, the individual is to some extent engaged in the business of satisfying his own motivations. Sometimes the individual moti-

vations are such that all members want the same *collective* outcomes, that is, they *share* the same goals for the group. For example, business partners committed to a 50-50 split of costs and profits presumably share the goal of group profit. What is in the best (economic) interests of the group is also in their own individual best interests. In other situations, the individual motivations of group members may not converge on the same goals and may in fact be incompatible.

In large measure, the motivations of individual group members depend on the nature of the rewards members hope to attain through group membership and group activity, the manner in which rewards are related to task performance, and the way in which rewards for group success are distributed among group members. We can distinguish at least three patterns in which individual and group performance and individual and group rewards can be related.

First, group members can receive rewards on the basis of their individual performances, without regard to the task performance of other members. In such a situation, group members are independent, rather than interdependent, at least with regard to their motivation-task performance-reward patterns.

Second, group members can be striving for rewards under conditions where the more one member gains the less others can gain. Here, the members are interdependent but are in competition for rewards. This condition has been termed *contriant interdependence* (Thomas, 1957).

Third, group members can be striving for rewards under conditions where the more one member gains the more all others gain as well. Here, members are interdependent but can gain rewards best if they cooperate with one another. This condition has been called *facilitative interdependence* (Thomas, 1957). Deutsch (1949), Mintz (1951), Thomas (1957), and others have shown that group task performance, as well as interpersonal relations among group members, are better under conditions of facilitative interdependence, where the motivational conditions tend to foster cooperative behavior, than under conditions of contriant interdependence, where the motivational conditions tend to foster competition among group members.

A fourth pattern can also occur. Group members can be striving for rewards that stem from interpersonal relationships as such and that are not contingent on the group's task success. Under these conditions, task performance of group members is unrelated to their rewards and the rewards of others, but group members are highly interdependent for the rewards that stem from pleasant interpersonal relations.

GROUP STRUCTURE: PATTERNS OF ROLE RELATIONSHIPS

WORK STRUCTURE AND THE TASK

The most obvious way to describe a set of roles is in terms of the part each role plays in the group's activity. When we consider the group's division of

labor, or division of task responsibilities, we may focus on the nature of the separate roles (such as task specialization) or on the pattern by which the set of task roles are integrated (for example, the bases for subgroupings of roles; the mechanisms for coordination between roles or sets of roles). This differentiation and integration of roles with respect to task activities is one major basis for describing the structure of a group.

The subject of division of labor and its consequences has been of concern in our society for many years. Much has been said about the advantages and disadvantages of task specialization. The main argument in favor of specialization has usually been based on the assumption that it makes for efficiency of task performance. If each man performs a limited set of activities for which he is highly trained, a set of specialists working together can accomplish a total job which involves so many diverse skills that no one man could have them all. This is one basic premise on which our modern, highly specialized, technologically sophisticated civilization has been built.

The main argument against task specialization has been in terms of its effects on individuals as human beings. The basic premise of this argument is that the satisfaction obtained from task accomplishment is an important factor in human adjustment and that such satisfaction is greatly reduced when the individual performs only a single, specific task operation and thus does not experience a feeling of accomplishment. This side effect of our industrial revolution has been considered a major cause of problems of individual adjustment in our modern world.

In spite of all the concern and discussion of the effects of task specialization, we still do not have much *scientific* knowledge (as opposed to opinion) about those effects. There is little evidence that task specialization as such affects individual morale or adjustment, although there is convincing evidence that being relatively isolated in the communication pattern of a work group does have such negative effects. We also have evidence that participation in decisions affecting one's job yields more favorable attitudes and better performance (see Coch and French, 1948; Mulder, 1959). But communication isolation and lack of opportunity to make job decisions are not necessary parts of task specialization.

There is little evidence about the task performance effects of specialization. It is doubtless true that large and complex tasks can be accomplished better if they are divided among several people and that a task will not be done at all if no one who is available has the ability to do it. We do not know, however, how best to divide up any particular task into specialized jobs. Such a division must reckon with at least three facets of the problem. First, the division of jobs must relate closely to the distribution of skills among the people who do the jobs. For example, if all elementary school teachers were trained as specialists in only one subject, we would have to use a team-teaching system rather than a homeroom-teacher system. Secondly, the division of jobs must be made so that the jobs tie in well together; we must be sure that completion of task *A* is all that is required

before task *B* can be carried out. Third, we must divide tasks so that they can be efficiently coordinated in time and space. The efficiency of task specialization is lost, for example, if an automobile manufacturer ends up with 30,000 motors and only 10,000 bodies.

A great deal of "applied" research has been done on task differentiation and coordination in industrial and military settings. Early efforts on these problems were called time and motion studies and grew out of F. W. Taylor's (1911) crusade for scientific management. Later efforts have been carried out under the headings of operations research and recently systems research. Unfortunately, however, most of this research is particularistic, that is, geared to determine the best division and coordination of activity for a *particular* complex task (such as the launching of a particular missile). Hence, it does not add much to our *general* knowledge of the effects of different work-structure patterns.

Research on the more general problem of work structure is fairly scarce. Lanzetta and Roby (1956) have compared two general types of work structure: a *horizontal* division of labor, in which each man handles the several different parts of a group task but does so for only one portion of the group's area of responsibility; and a *vertical* division of labor, in which each man handles only one part of the group's task but does so for the group's entire area of responsibility. They found the former to be slightly more efficient, especially for reasonably light work loads, but this difference was *reversed* for heavier work loads. While differences were not strong, they suggest that the best division of labor even for a particular task depends partly on work load.

The Lanzetta and Roby study is based on the condition that every man has the necessary skills to perform all tasks involved. This is often not the case, especially for groups performing highly specialized tasks requiring extensive training.

The nature of the group's task interacts with the group's work structure. The kind of task the group is performing affects the kinds of activity and coordination required, and this in turn affects the choice of the most appropriate division of labor. A wide variety of tasks have been studied in small group research, but relatively little systematic investigation has been done of the properties of the tasks themselves.

Carter *et al.* (1950) studied group performance on a number of tasks and concluded that from the point of view of effective leadership there are at least two distinct kinds of group tasks: intellectual tasks and manual, or "do with the hands," tasks. Many further distinctions can be made within the global category of intellectual tasks. For example, many researchers have distinguished between problem-solving and creative tasks (for example, Fiedler, 1962). Problem-solving tasks require the group to *integrate* various pieces of information into "the" solution, or the best solution. Creative tasks require the group to *generate* a number of original ideas about a topic. Some tasks, of course, require both the gener-

ation of new ideas and their synthesis into a coherent solution. We can distinguish also another type of intellectual task, negotiation tasks, which require members to *integrate divergent attitudes or values* rather than generate or integrate information.

It would appear that such task differences, which require different patterns of task activity and interaction among members, may also require different patterns of role differentiation and coordination. Recently, Shaw (1963) proposed a set of ten dimensions for describing and differentiating a wide range of group tasks. These include such properties as single versus multiple paths to goal; clarity of the relationship between path and goal; specificity versus generality of the solution. These dimensions offer a substantial refinement of the gross categories of intellectual versus manual tasks and problem-solving versus creative tasks. Such a schema, when fully elaborated, may make it possible to compare results obtained on various group tasks and to explore relationships between type of task and the group's division of labor.

Analytically, we can specify the *connection* between task roles of any two people as one of several types: (1) A and B can do the same task, while working independently (for example, Lanzetta and Roby's horizontal structure, or tellers at adjacent windows in a bank); (2) A and B can work on separate, sequential steps of the same task, so that A's output provides B's input (Lanzetta and Roby's vertical structure, or workers at adjacent stations on an assembly line); (3) A and B can work on complementary aspects of the same task simultaneously (a blocker and a ball carrier on a football team, or the members of a land-survey team); (4) B may direct or supervise the activities of A.

These types of task connections have different implications for the degree to which A and B are dependent on each other for their activities. In type 1, A and B are unrelated; their task performances are independent. In type 2, B is dependent on A, because an error in performance by A disrupts B's task performance. In type 3, A and B are interdependent; the performance of each affects the requirements placed on the other. In type 4, A is dependent on B for direction of his work and in terms of its evaluation, but B is dependent on A in another sense, because A must do part of the job for which B is responsible. Such task relations between group members also affect the influence relations and the communication relations that are likely to develop between them.

POWER STRUCTURE

The set of roles within a group may be described in terms of the relative authority or *power* of each role. In a formal group, each role can be designated as to its position in an authority or power hierarchy, and as to its superordinate or subordinate relation to other roles. In informal groups, differentiations in power are likely to be equally prominent though less explicitly defined.

There are many forms or bases of power. French and Raven (1959) define

power as the *potential* influence of person O on person P in a particular area. They distinguish five bases of power: (1) reward power; (2) coercive power; (3) legitimate power, such as the "right" of a formally chosen leader to direct the actions of members; (4) referent power, or power based on P's liking for or identification with O; and (5) power based on expert knowledge. Even in informal and transient groups, members tend to differ in their relative power (potential influence). Degree of power tends to correlate with the holding of a position of formal leadership, but is by no means entirely a matter of such formal authority. The degree of power O has over P is also related to his friendship or affect relations with P. A group (or one of its members) can have power to influence a particular member P to the extent that P is attracted to that group, that is, to the extent that the group can provide or withhold rewards which are valuable to P.

Sometimes the power of a role derives from the status of the person who happens to occupy that role in the group. By "status" we mean the prestige the individual possesses as a person, independent of his position in a particular group. Such status can arise from the person's general social status (wealth or position of prestige) or from specific features of his background such as age, sex, race, education. (The latter are the institutionalized positions he occupies in the general society.) Strodtbeck and his associates (1957) have shown that both males and persons of higher socioeconomic status have more influence in jury deliberations than females or persons of lower socioeconomic status. . . .

Hurwitz and his associates (1960) found that persons representing higher-status professions (such as medicine) in an interdisciplinary conference on mental health had more influence than those representing lower-status groups (such as nurses, teachers, clergymen), independent of their actual contributions to the conference deliberations. . . . In children's groups, influence may be related to physical size, athletic skill, or fighting ability (Lippett *et al.*, 1952). Thus, even though a group explicitly assumes that all its members are equal in power (and both the jury and the interdisciplinary conference are predicated on that assumption), members may actually wield different degrees of power based on their general or specific statuses in the broader community within which the group exists.

COMMUNICATION STRUCTURE

A third basis for describing the structure of a group is in terms of the pattern of communication linkages among its members. A group's communication structure may be considered as the set of *possible* or *permissible* communication links or as the pattern of communication channels actually utilized during group activity. Here again, it is possible to focus on the communication properties of a particular role (for example, how central it is in the group's communication network; how heavy the load of messages which arise at or are sent to that position); or on the over-all pattern of the group's communication net (how much it

The circle, a decentralized
communication network in
which all members are equally
central

The wheel, a centralized
communication network in
which position C is central
and all others are peripheral

The chain, a moderately centralized
communication network in which
position C is central, positions B and
D are intermediate, and positions A
and E are peripheral

FIGURE 1. Diagram of some communication patterns used in studies of groups
with experimentally restricted communication networks. Boxes labeled A, B, C,
D, and E represent positions; lines represent possible communication channels
between persons in designated positions.

is centralized around one person; how many total communication links there
are).

A number of experiments have shown that the communication structure of a
group has important consequences for the group's task performance and for the
members' morale or satisfaction. Most of these studies were conducted with small
groups that had experimentally imposed restrictions on the communication links
among members. (For further descriptions of studies of restricted communica-
tion nets, see Leavitt, 1951; Bavelas, 1950; Guetzkow and Simon, 1955; Shaw,
1954; and a review of Glanzer and Glaser, 1961). The logic of these communica-
tion-net studies is as follows. If we restrict the potential communication channels
within a group (if we permit each member to communicate only with certain
other members), the actual flow of communications will necessarily be restricted.
How will differences in flow of communication affect the group's task perform-
ance and the reactions of the members to the situation?

Most communication-net studies have been done with four- or five-man
groups. Only certain pairs of members were permitted to communicate with each
other, some of the potential channels being eliminated by experimental arrange-

ments. The method of communication was restricted either to written notes or to non-face-to-face verbal communication over an intercom system. The open channels were usually two-way, permitting feedback. Sometimes limits were placed on the rate and the content of messages. The problems used always required an interchange of information; they sometimes required some problem-solving activities; they usually required feedback of information or solutions to other group members. The communication nets varied primarily in degree of centralization, that is, in how much they forced communication to be routed to one central person. Some typical communication nets studied in these experiments are shown in Figure 1.

These studies show two major results:

a. For simple problems, centralized nets (such as the wheel and to a lesser degree the chain in Figure 1) produce faster and more accurate problem solving than less centralized nets (such as the circle in Figure 1). The leader (position C in the centralized nets in Figure 1) is happy in his central position but other group members are less satisfied. Individual satisfaction is directly related to the individual's centrality in the group (how near he is to the central person in terms of communication links).

b. For more complex problems, performance differences among nets tend to diminish. The effectiveness of highly centralized nets depends largely on the leader's ability and his utilization of members' skills. The relationship between member satisfaction and member centrality, however, tends to persist for the more complex problems.

Laboratory studies by Kelley (1951) and Thibaut (1950) have shown also that the frequency, direction, and content of actual communications in groups which had no externally imposed communication restrictions are related to the relative status of members and the likelihood that their status could change. In general, high-status members talked more than low-status members, and both high- and low-status members directed more communications to those with high status. When low-status members had no chance for upward status movement, they directed more communications to high-status persons and engaged in more task-irrelevant communications than did low-status members who had some possibility of an upward change in status. Presumably, upward communication in this instance served as a substitute for upward status movement. . . .

FRIENDSHIP OR AFFECT STRUCTURE

There is at least one other general basis for description of group structure, namely, the friendship or affect pattern of a group. The affect structure has to do with patterns of relationships among group members as persons, rather than the relationships among roles. The member structure patterns, however, are highly interdependent with various dimensions of the group's role structure.

For one thing, there are fairly strong role expectations about what kind of affect relations ought to exist between persons in certain role relationships. For example, mothers "should" love their children; bosses "should" be friendly but retain a certain aloofness or businesslike attitude in relation to subordinates; soldiers "should" hate enemy soldiers; in some situations the worker is expected to be hostile toward the boss. For the most part, such expected affect relations between occupants of different positions actually become a part of the role relationship between them.

The communication pattern also influences (and is influenced by) the affect relations that develop between occupants of different positions. We seldom develop either positive or negative attitudes toward persons with whom we do not interact (except, of course, toward persons in positions for which our own position gives us an expected affect relation, for example, toward "an enemy"). We may, of course, develop strong attitudes toward public figures, such as political leaders. When we do, though, we often feel that we know them, even though we are aware that they do not have reciprocal attitudes.

In fact, Festinger and his associates (1950) have shown that mere proximity, which provides the opportunity to interact, is the most important factor in determining what friendship patterns arise between families within a housing development. That is, we develop friendships with those with whom we have occasion to interact. Conversely, Newcomb (1961) has shown that once a friendship pattern has been established, we tend to seek opportunities to interact with those we like and avoid interaction with those we dislike.

Affect relations show the same kind of interdependence with power relations. In all the studies of effects of power or status which we have cited (Strodtbeck *et al.*, 1957; Hurwitz *et al.*, 1960; Lippett *et al.*, 1952; Kelley, 1951; Thibaut, 1950), persons with high status not only received more deference but also were more popular. We tend to be attracted to people who occupy positions of high power. Of course, this tendency depends on the form or basis of that power; it probably does not hold for power based on coercion, for example. Conversely, we tend to influence and be influenced by those we like. Back (1951) has shown that two-person groups whose members like one another exhibit more attempted influence and more often succeed in these attempts, than groups whose members do not like one another. The tendency to be influenced by those we like may account for the rule in many work organizations which forbids nepotism (employment of two or more persons who are related by blood or marriage). Role relations on the job are expected to be affectively neutral; while role relations among kinfolk are expected to include positive affect. We therefore expect (and indeed often find) that the juxtaposition of these two kinds of role relations within the same role system may have disruptive effects.

We can consider the over-all pattern of affect relations in a group, as well as the affect ties of a particular member. Groups vary in terms of the extent to which the pattern of affect relationships among members tends to partition the

group into separate subgroups or cliques, and in terms of whether there is active hostility or just lack of positive relations between members of one clique and another. Interaction cliques tend to become affect cliques, and vice versa. Such divisions within a group may or may not correspond with task-based subgroupings. The presence of antagonistic cliques in a group detracts from the efficiency of group-task performance, at least when the task requires close coordination between persons in the different cliques.

Similarly, we can consider the effects of the over-all level of positive or negative affect relations in a group. Much has been written about the importance of good interpersonal relations in work groups, most of it on the assumption that groups whose members like one another perform their tasks better. Actually, there is little research evidence on the connection between interpersonal relations and task effectiveness, and what evidence does exist is not at all clear-cut. It does seem clear that negative affect relations within a group disrupt group performance; it does not necessarily follow, however, that positive affect relations facilitate group performance.

Too much friendship within a work group can result in the group's spending most of its time on social activities rather than on the task. Even when a group with highly positive interpersonal relations does concentrate on task activities, there is no guarantee that it will do so effectively. When a group does have positive interpersonal relations among its members, though, there is at least some assurance that the group's task performance will not be hindered by the disruptive effects of negative interpersonal relations, and the group's task performance will depend more closely on the skills and abilities of its members and on the extent to which its task and communication structures facilitate (or hinder) task performance.

Although positive interpersonal relations among members do not necessarily lead to group task success, task success does seem to lead to an increase in positive affect relations among group members. Thus, we tend to like those who have helped us gain rewards.

This discussion is related to a structure problem that can have serious consequences for members of formal work organizations; namely, the problem of the "fit" between the affect structure of the group and its formal work, authority, and communication structures. Formal organizations usually spell out task responsibilities and power relations among members. Usually they also specify preferred or required communication relations among members (and, by implication, those possible communication linkages that are not supposed to be used), at least regarding the communication of task-relevant and organization-relevant information. These structure patterns are often embodied in a formal organization chart. Within such formal organizations, informal friendship groups often develop. These are likely to have informal communication structures, utilized primarily for nontask communications. The informal communication pattern may

or may not conflict with the formal pattern of communication as prescribed in the organization chart.

An individual member is likely to have a position and a set of roles in both the formal and informal structures. In certain situations role expectations for his behavior may be divergent and mutually exclusive. Thus, the individual may be placed in a role-conflict situation. Resolution of such role conflicts depends on the relative attraction of the member to the formal and informal groups, which in turn depends upon how well these groups satisfy his various needs and aspirations. The formal organization may largely control the satisfaction of certain of the individual's goals, such as economic gain or occupational status. The informal group is likely to be the main instrument for satisfaction of other goals, such as recognition, prestige, friendship. Resolution of such role conflicts often requires the individual to choose between a number of important and separate goals or compromise. . . .

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ACHIEVING CHANGE IN PEOPLE: SOME APPLICATIONS OF GROUP DYNAMICS THEORY

Dorwin Cartwright

I

We hear all around us today the assertion that the problems of the twentieth century are problems of human relations. The survival of civilization, it is said, will depend upon man's ability to create social inventions capable of harnessing, for society's constructive use, the vast physical energies now at man's disposal. Or, to put the matter more simply, we must learn how to change the way in which people behave toward one another. In broad outline, the specifications for a good society are clear, but a serious technical problem remains: How can we change people so that they neither restrict the freedom nor limit the potentialities for growth of others; so that they accept and respect people of different religion, nationality, color, or political opinion; so that nations can exist in a world without war, and so that the fruits of our technological advances can bring economic well-being and freedom from disease to all the people of the world? Although few people would disagree with these objectives when stated abstractly, when we become more specific, differences of opinion quickly arise. How is change to be produced? Who is to do it? Who is to be changed? These questions permit no ready answers.

Before we consider in detail these questions of social technology, let us clear away some semantic obstacles. The word "change" produces emotional reactions. It is not a neutral word. To many people it is threatening. It conjures up visions of a revolutionary, a dissatisfied idealist, a trouble-maker, a malcontent. Nicer words referring to the process of changing people are "education," "training," "orientation," "guidance," "indoctrination," "therapy." We are more ready to have others "educate" us than to have them "change" us. We, ourselves, feel less guilty in "training" others than in "changing" them. Why this emotional response? What makes the two kinds of words have such different meanings? I believe that a large part of the difference lies in the fact that the safer words (like "education" or "therapy") carry the implicit assurance that the only changes produced will be good ones, acceptable within a currently held value system. The cold, unmodified word "change," on the contrary, promises no respect for values; it might even tamper with values themselves. Perhaps for this very reason it will foster straight thinking if we use the word "change" and thus force ourselves to struggle directly and self-consciously with the problems of value that are involved. Words like "education," "training," or "therapy," by the very fact that they are not so disturbing, may close our eyes to the fact that they too inevitably involve values.

Another advantage of using the word "change" rather than other related words is that it does not restrict our thinking to a limited set of aspects of people that are legitimate targets of change. Anyone familiar with the history of education knows that there has been endless controversy over what it is about people that "education" properly attempts to modify. Some educators have viewed education simply as imparting knowledge, others mainly as providing skills for doing things, still others as producing healthy "attitudes," and some have aspired to instil a way of life. Or if we choose to use a word like "therapy," we can hardly claim that we refer to a more clearly defined realm of change. Furthermore, one can become inextricably entangled in distinctions and vested interests by attempting to distinguish sharply between, let us say, the domain of education and that of therapy. If we are to try to take a broader view and to develop some basic principles that promise to apply to all types of modifications in people, we had better use a word like "change" to keep our thinking general enough.

The proposal that social technology may be employed to solve the problems of society suggests that social science may be applied in ways not different from those used in the physical sciences. Does social science, in fact, have any practically useful knowledge which may be brought to bear significantly on society's most urgent problems? What scientifically based principles are there for guiding programs of social change? In this paper we shall restrict our considerations to certain parts of a relatively new branch of social science known as "group dynamics." We shall examine some of the implications for social action which stem from research in this field of scientific investigation.

What is "group dynamics"? Perhaps it will be most useful to start by look-

ing at the derivation of the word "dynamics." It comes from a Greek word mean-
ing force. In careful usage of the phrase, "group dynamics" refers to the forces
operating in groups. The investigation of group dynamics, then, consists of a
study of these forces: what gives rise to them, what conditions modify them,
what consequences they have, etc. The practical application of group dynamics
(or the technology of group dynamics) consists of the utilization of knowledge
about these forces for the achievement of some purpose. In keeping with this def-
inition, then, it is clear that group dynamics, as a realm of investigation, is not
particularly novel, nor is it the exclusive property of any person or institution. It
goes back at least to the outstanding work of men like Simmel, Freud, and
Cooley.

Although interest in groups has a long and respectable history, the past fif-
teen years have witnessed a new flowering of activity in this field. Today, re-
search centers in several countries are carrying out substantial programs of re-
search designed to reveal the nature of groups and of their functioning. The
phrase "group dynamics" has come into common usage during this time and in-
tense efforts have been devoted to the development of the field, both as a branch
of social science and as a form of social technology.

In this development the name of Kurt Lewin has been outstanding. As a
consequence of his work in the field of individual psychology and from his anal-
ysis of the nature of the pressing problems of the contemporary world, Lewin be-
came convinced of society's urgent need for a *scientific approach* to the under-
standing of the dynamics of groups. In 1945 he established the Research Center
for Group Dynamics to meet this need. Since that date the Center has been devot-
ing its efforts to improving our scientific understanding of groups through labo-
ratory experimentation, field studies, and the use of techniques of action re-
search. It has also attempted in various ways to help get the findings of social
science more widely used by social management. Much of what I have to say in
this paper is drawn from the experiences of this Center in its brief existence of a
little more than five years (2).

II

For various reasons we have found that much of our work has been devoted
to an attempt to gain a better understanding of the ways in which people change
their behavior or resist efforts by others to have them do so. Whether we set for
ourselves the practical goal of improving behavior or whether we take on the in-
tellectual task of understanding why people do what they do, we have to investi-
gate processes of communication, influence, social pressure—in short, problems
of change.

In this work we have encountered great frustration. The problems have been

most difficult to solve. Looking back over our experience, I have become con-
vinced that no small part of the trouble has resulted from an irresistible tendency
to conceive of our problems in terms of the individual. We live in an individual-
istic culture. We value the individual highly, and rightly so. But I am inclined to
believe that our political and social concern for the individual has narrowed our
thinking as social scientists so much that we have not been able to state our re-
search problems properly. Perhaps we have taken the individual as the unit of
observation and study when some larger unit would have been more appropriate.
Let us look at a few examples.

Consider first some matters having to do with the mental health of an indi-
vidual. We can all agree, I believe, that an important mark of a healthy personal-
ity is that the individual's self-esteem has not been undermined. But on what
does self-esteem depend? From the research on this problem we have discovered
that, among other things, repeated experiences of failure or traumatic failures on
matters of central importance serve to undermine one's self-esteem. We also know
that whether a person experiences success or failure as a result of some undertak-
ing depends upon the level of aspiration which he has set for himself. Now, if we
try to discover how the level of aspiration gets set, we are immediately involved
in the person's relationships to groups. The groups to which he belongs set stand-
ards for his behavior which he must accept if he is to remain in the group. If his
capacities do not allow him to reach these standards, he experiences failure, he
withdraws or is rejected by the group, and his self-esteem suffers a shock.

Suppose, then, that we accept a task of therapy, of rebuilding his self-es-
teem. It would appear plausible from our analysis of the problem that we should
attempt to work with variables of the same sort that produced the difficulty, that
is to work with him either in the groups to which he now belongs or to introduce
him into new groups which are selected for the purpose and to work upon his re-
lationships to groups as such. From the point of view of preventive mental
health, we might even attempt to train the groups in our communities—classes in
schools, work groups in business, families, unions, religious and cultural
groups—to make use of practices better designed to protect the self-esteem of
their members.

Consider a second example. A teacher finds that in her class she has a num-
ber of trouble-makers, full of aggression. She wants to know why these children
are so aggressive and what can be done about it. A foreman in a factory has the
same kind of problem with some of his workers. He wants the same kind of help.
The solution most tempting to both the teacher and the foreman often is to trans-
fer the worst trouble-makers to someone else, or if facilities are available, to refer
them for counselling. But is the problem really of such a nature that it can be
solved by removing the trouble-maker from the situation or by working on his
individual motivations and emotional life? What leads does research give us?
The evidence indicates, of course, that there are many causes of aggressiveness in

people, but one aspect of the problem has become increasingly clear in recent years. If we observe carefully the amount of aggressive behavior and the number of trouble-makers to be found in a large collection of groups, we find that these characteristics can vary tremendously from group to group even when the different groups are composed essentially of the same kinds of people. In the now classic experiments of Lewin, Lippitt, and White (7) on the effects of different styles of leadership, it was found that the same group of children displayed markedly different levels of aggressive behavior when under different styles of leadership. Moreover, when individual children were transferred from one group to another, their levels of aggressiveness shifted to conform to the atmosphere of the new group. Efforts to account for one child's aggressiveness under one style of leadership merely in terms of his personality traits could hardly succeed under these conditions. This is not to say that a person's behavior is entirely to be accounted for by the atmosphere and structure of the immediate group, but it is remarkable to what an extent a strong, cohesive group can control aspects of a member's behavior traditionally thought to be expressive of enduring personality traits. Recognition of this fact rephrases the problem of how to change such behavior. It directs us to a study of the sources of the influence of the group on its members.

Let us take an example from a different field. What can we learn from efforts to change people by mass media and mass persuasion? In those rare instances when educators, propagandists, advertisers, and others who want to influence large numbers of people, have bothered to make an objective evaluation of the enduring changes produced by their efforts, they have been able to demonstrate only the most negligible effects (1). The inefficiency of attempts to influence the public by mass media would be scandalous if there were agreement that it was important or even desirable to have such influences strongly exerted. In fact, it is no exaggeration to say that all of the research and experience of generations has not improved the efficiency of lectures or other means of mass influence to any noticeable degree. Something must be wrong with our theories of learning, motivation, and social psychology.

Within very recent years some research data have been accumulating which may give us a clue to the solution of our problem. In one series of experiments directed by Lewin, it was found that a method of group decision, in which the group as a whole made a decision to have its members change their behavior, was from two to ten times as effective in producing actual change as was a lecture presenting exhortation to change (6). We have yet to learn precisely what produces these differences of effectiveness, but it is clear that by introducing group forces into the situation a whole new level of influence has been achieved.

The experience has been essentially the same when people have attempted to increase the productivity of individuals in work settings. Traditional conceptions of how to increase the output of workers have stressed the individual: select the right man for the job; simplify the job for him; train him in the skills required;

motivate him by economic incentives; make it clear to whom he reports; keep the lines of authority and responsibility simple and straight. But even when all these conditions are fully met we are finding that productivity is far below full potential. There is even good reason to conclude that this individualistic concep- tion of the determinants of productivity actually fosters negative consequences. The individual, now isolated and subjected to the demands of the organization through the commands of his boss, finds that he must create with his fellow em- ployees informal groups, not shown on any table of organization, in order to pro- tect himself from arbitrary control of his life, from the boredom produced by the endless repetition of mechanically sanitary and routine operations, and from the impoverishment of his emotional and social life brought about by the frustration of his basic needs for social interaction, participation, and acceptance in a stable group. Recent experiments have demonstrated clearly that the productivity of work groups can be greatly increased by methods of work organization and su- pervision which give more responsibility to work groups, which allow for fuller participation in important decisions, and which make stable groups the firm basis for support of the individual's social needs (3). I am convinced that future research will also demonstrate that people working under such conditions become more mature and creative individuals in their homes, in community life, and as citizens.

As a final example, let us examine the experience of efforts to train people in workshops, institutes, and special training courses. Such efforts are common in various areas of social welfare, intergroup relations, political affairs, industry, and adult education generally. It is an unfortunate fact that objective evaluation of the effects of such training efforts has only rarely been undertaken, but there is evidence for those who will look that the actual change in behavior produced is most disappointing. A workshop not infrequently develops keen interest among the participants, high morale and enthusiasm, and a firm resolve on the part of many to apply all the wonderful insights back home. But what happens back home? The trainee discovers that his colleagues don't share his enthusiasm. He learns that the task of changing others' expectations and ways of doing things is discouragingly difficult. He senses, perhaps not very clearly, that it would make all the difference in the world if only there were a few other people sharing his enthusiasm and insights with whom he could plan activities, evaluate conse- quences of efforts, and from whom he could gain emotional and motivational support. The approach to training which conceives of its task as being merely that of changing the individual probably produces frustration, demoralization, and disillusionment in as large a measure as it accomplishes more positive re- sults.

A few years ago the Research Center for Group Dynamics undertook to shed light on this problem by investigating the operation of a workshop for training leaders in intercultural relations (8). In a project, directed by Lippitt, we set out

to compare systematically the different effects of the workshop upon trainees who came as isolated individuals in contrast to those who came as teams. Since one of the problems in the field of intercultural relations is that of getting people of good will to be more active in community efforts to improve intergroup relations, one goal of the training workshop was to increase the activity of the trainees in such community affairs. We found that before the workshop there was no differ-ence in the activity level of the people who were to be trained as isolates and of those who were to be trained as teams. Six months after the workshop, however, those who had been trained as isolates were only slightly more active than before the workshop whereas those who had been members of strong training teams were now much more active. We do not have clear evidence on the point, but we would be quite certain that the maintenance of heightened activity over a long period of time would also be much better for members of teams. For the isolates the effect of the workshop had the characteristic of a "shot in the arm" while for the team member it produced a more enduring change because the team provided continuous support and reinforcement for its members.

III

What conclusions may we draw from these examples? What principles of achieving change in people can we see emerging? To begin with the most general proposition, we may state that the behavior, attitudes, beliefs, and values of the individual are all firmly grounded in the groups to which he belongs. How aggressive or cooperative a person is, how much self-respect and self-confidence he has, how energetic and productive his work is, what he aspires to, what he be-lieves to be true and good, whom he loves or hates, and what beliefs and preju-dices he holds—all these characteristics are highly determined by the individual's group memberships. In a real sense, they are properties of groups and of the re-lationships between people. Whether they change or resist change will, therefore, be greatly influenced by the nature of these groups. Attempts to change them must be concerned with the dynamics of groups.

In examining more specifically how groups enter into the process of change, we find it useful to view groups in at least three different ways. In the first view, the group is seen as a source of influence over its members. Efforts to change be-havior can be supported or blocked by pressures on members stemming from the group. To make constructive use of these pressures the group must be used *as a medium of change*. In the second view, the group itself becomes the *target of change*. To change the behavior of individuals it may be necessary to change the standards of the group, its style of leadership, its emotional atmosphere, or its stratification into cliques and hierarchies. Even though the goal may be to

change the behavior of *individuals*, the target of change becomes the group. In the third view, it is recognized that many changes of behavior can be brought about only by the organized efforts of groups *as agents of change*. A committee to combat intolerance, a labor union, an employers association, a citizens group to increase the pay of teachers—any action group will be more or less effective depending upon the way it is organized, the satisfactions it provides to its members, the degree to which its goals are clear, and a host of other properties of the group.

An adequate social technology of change, then, requires at the very least a scientific understanding of groups viewed in each of these ways. We shall consider here only the first two aspects of the problem: the group as a medium of change and as a target of change.

THE GROUP AS A MEDIUM OF CHANGE

PRINCIPLE NO. 1.   If the group is to be used effectively as a medium of change, those people who are to be changed and those who are to exert influence for change must have a strong sense of belonging to the same group.

Kurt Lewin described this principle well: "The normal gap between teacher and student, doctor and patient, social worker and public, can . . . be a real obstacle to acceptance of the advocated conduct." In other words, in spite of whatever status differences there might be between them, the teacher and the student have to feel as members of one group in matters involving their sense of values. The chances for re-education seem to be increased whenever a strong we-feeling is created (5). Recent experiments by Preston and Heintz have demonstrated greater changes of opinions among members of discussion groups operating with participatory leadership than among those with supervisory leadership (12). The implications of this principle for classroom teaching are far-reaching. The same may be said of supervision in the factory, army, or hospital.

PRINCIPLE NO. 2.   The more attractive the group is to its members the greater is the influence that the group can exert on its members.

This principle has been extensively documented by Festinger and his co-workers (4). They have been able to show in a variety of settings that in more cohesive groups there is a greater readiness of members to attempt to influence others, a greater readiness to be influenced by others, and stronger pressures toward conformity when conformity is a relevant matter for the group. Important for the practitioner wanting to make use of this principle is, of course, the question of how to increase the attractiveness of groups. This is a question with many answers. Suffice it to say that a group is more attractive the more it satisfies the

needs of its members. We have been able to demonstrate experimentally an increase in group cohesiveness by increasing the liking of members for each other as persons, by increasing the perceived importance of the group goal, and by increasing the prestige of the group among other groups. Experienced group workers could add many other ways to this list.

PRINCIPLE NO. 3. In attempts to change attitudes, values, or behavior, the more relevant they are to the basis of attraction to the group, the greater will be the influence that the group can exert upon them.

I believe this principle gives a clue to some otherwise puzzling phenomena. How does it happen that a group, like a labor union, seems to be able to exert such strong discipline over its members in some matters (let us say in dealings with management), while it seems unable to exert nearly the same influence in other matters (let us say in political action)? If we examine why it is that members are attracted to the group, I believe we will find that a particular reason for belonging seems more related to some of the group's activities than to others. If a man joins a union mainly to keep his job and to improve his working conditions, he may be largely uninfluenced by the union's attempt to modify his attitudes toward national and international affairs. Groups differ tremendously in the range of matters that are relevant to them and hence over which they have influence. Much of the inefficiency of adult education could be reduced if more attention were paid to the need that influence attempts be appropriate to the groups in which they are made.

PRINCIPLE NO. 4. The greater the prestige of a group member in the eyes of the other members, the greater the influence he can exert.

Polansky, Lippitt, and Redl (11) have demonstrated this principle with great care and methodological ingenuity in a series of studies in children's summer camps. From a practical point of view it must be emphasized that the things giving prestige to a member may not be those characteristics most prized by the official management of the group. The most prestige-carrying member of a Sunday School class may not possess the characteristics most similar to the minister of the church. The teacher's pet may be a poor source of influence within a class. This principle is the basis for the common observation that the official leader and the actual leader of a group are often not the same individual.

PRINCIPLE NO. 5. Efforts to change individuals or subparts of a group which, if successful, would have the result of making them deviate from the norms of the group will encounter strong resistance.

During the past few years a great deal of evidence has been accumulated showing the tremendous pressures which groups can exert upon members to con-

form to the group's norms. The price of deviation in most groups is rejection or even expulsion. If the member really wants to belong and be accepted, he cannot withstand this type of pressure. It is for this reason that efforts to change people by taking them from the group and giving them special training so often have disappointing results. This principle also accounts for the finding that people thus trained sometimes display increased tension, aggressiveness toward the group, or a tendency to form cults or cliques with others who have shared their training.

These five principles concerning the group as a medium of change would appear to have readiest application to groups created for the purpose of producing changes in people. They provide certain specifications for building effective training or therapy groups. They also point, however, to a difficulty in producing change in people in that they show how resistant an individual is to changing in any way contrary to group pressures and expectations. In order to achieve many kinds of changes in people, therefore, it is necessary to deal with the group as a target of change.

THE GROUP AS A TARGET OF CHANGE

PRINCIPLE NO. 6. Strong pressure for changes in the group can be established by creating a shared perception by members of the need for change, thus making the source of pressure for change lie within the group.

Marrow and French (9) report a dramatic case-study which illustrates this principle quite well. A manufacturing concern had a policy against hiring women over thirty because it was believed that they were slower, more difficult to train, and more likely to be absent. The staff psychologist was able to present to management evidence that this belief was clearly unwarranted at least within their own company. The psychologist's facts, however, were rejected and ignored as a basis for action because they violated accepted beliefs. It was claimed that they went against the direct experience of the foremen. Then the psychologist hit upon a plan for achieving change which differed drastically from the usual one of argument, persuasion, and pressure. He proposed that management conduct its own analysis of the situation. With his help management collected all the facts which they believed were relevant to the problem. When the results were in they were now their own facts rather than those of some *"outside"* expert. Policy was immediately changed without further resistance. The important point here is that facts are not enough. The facts must be the accepted property of the group if they are to become an effective basis for change. There seems to be all the difference in the world in changes actually carried out between those cases in which a consulting firm is hired to do a study and present a report and those in which technical experts are asked to collaborate with the group in doing its own study.

PRINCIPLE NO. 7. Information relating to the need for change, plans for change, and consequences of change must be shared by all relevant people in the group.

Another way of stating this principle is to say that change of a group ordinarily requires the opening of communication channels. Newcomb (10) has shown how one of the first consequences of mistrust and hostility is the avoidance of communicating openly and freely about the things producing the tension. If you look closely at a pathological group (that is, one that has trouble making decisions or effecting coordinated efforts of its members), you will certainly find strong restraints in that group against communicating vital information among its members. Until these restraints are removed there can be little hope for any real and lasting changes in the group's functioning. In passing it should be pointed out that the removal of barriers to communication will ordinarily be accompanied by a sudden increase in the communication of hostility. The group may appear to be falling apart, and it will certainly be a painful experience to many of the members. This pain and the fear that things are getting out of hand often stop the process of change once begun.

PRINCIPLE NO. 8. Changes in one part of a group produce strain in other related parts which can be reduced only by eliminating the change or by bringing about readjustments in the related parts.

It is a common practice to undertake improvements in group functioning by providing training programs for certain classes of people in the organization. A training program for foremen, for nurses, for teachers, or for group workers is established. If the content of the training is relevant for organizational change, it must of necessity deal with the relationships these people have with other subgroups. If nurses in a hospital change their behavior significantly, it will affect their relations both with the patients and with the doctors. It is unrealistic to assume that both these groups will remain indifferent to any significant changes in this respect. In hierarchical structures this process is most clear. Lippitt has proposed on the basis of research and experience that in such organizations attempts at change should always involve three levels, one being the major target of change and the other two being the one above and the one below.

IV

These eight principles represent a few of the basic propositions emerging from research in group dynamics. Since research is constantly going on and since it is the very nature of research to revise and reformulate our conceptions, we may be sure that these principles will have to be modified and improved as

time goes by. In the meantime they may serve as guides in our endeavors to develop a scientifically based technology of social management.

In social technology, just as in physical technology, invention plays a crucial role. In both fields progress consists of the creation of new mechanisms for the accomplishment of certain goals. In both fields inventions arise in response to practical needs and are to be evaluated by how effectively they satisfy these needs. The relation of invention to scientific development is indirect but important. Inventions cannot proceed too far ahead of basic scientific development, nor should they be allowed to fall too far behind. They will be more effective the more they make good use of known principles of science, and they often make new developments in science possible. On the other hand, they are in no sense logical derivations from scientific principles.

I have taken this brief excursion into the theory of invention in order to make a final point. To many people "group dynamics" is known only for the social inventions which have developed in recent years in work with groups. Group dynamics is often thought of as certain techniques to be used with groups. Role playing, buzz groups, process observers, post-meeting reaction sheets, and feedback of group observations are devices popularly associated with the phrase "group dynamics." I trust that I have been able to show that group dynamics is more than a collection of gadgets. It certainly aspires to be a science as well as a technology.

This is not to underplay the importance of these inventions nor of the function of inventing. As inventions they are all mechanisms designed to help accomplish important goals. How effective they are will depend upon how skilfully they are used and how appropriate they are to the purposes to which they are put. Careful evaluative research must be the ultimate judge of their usefulness in comparison with alternative inventions. I believe that the principles enumerated in this paper indicate some of the specifications that social inventions in this field must meet.

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INTERPERSONAL NETWORKS: COMMUNICATING WITHIN THE GROUP

Elihu Katz and Paul Lazarsfeld

THE PATTERNS OF TRANSMISSION

We are interested here in what holds people together in an interpersonal communications network, and we are interested in the variety of communications patterns that take shape under different social conditions. . . . We shall consider these matters under three separate headings, the first of which is concerned with the influence on interpersonal communication of the structure of social connections among individuals.

STRUCTURAL CONNECTIONS: THE NETWORKS OF COMMUNICATIONS FLOW

Differences in the degree of mutual attraction among individuals, differences in the degree of their interdependence, differences in status, and, of course, mere differences in such things as propinquity or group size will make for significant differences in the rate of contact and communication and often, too, in the content of what is communicated. These are some of the elements of group structure, and there are a variety of studies to show how they are related to interpersonal communication.

Festinger *et al.* demonstrate, for example, how friendship ties operate as links in a communications network, in their studies of the transmission of rumors in two communities.[1] In "Regent Hill," a rumor spread to 62 per cent of those who had close friends in the community, to 42 per cent of those who had only acquaintances and to 33 per cent of those who claimed no friends at all in the neighborhood. In their Westgate study of the students' housing development, sociometric friendship choices accounted for the direction taken by almost half (six of fourteen) of the instances in which a planted rumor was passed on. Moreno (1953), too, studied a rumor and found that it followed very closely the path he had predicted for it in terms of the "psycho-social networks" which he had mapped out.[2] "Friendship between two people," says Festinger, "implies the existence of an active channel of communication."[3]

The sociometric method permits the study of communications flow in terms of an objectively delineable pattern of individual relationships. Thus, a rumor or a bit of news or an action-stimulant introduced into a social group whose sociometric connections are known, can be watched almost the way the doctor watches the flow of chalky liquid introduced into the human body during a fluoroscopic examination.

Rumor is not the only kind of interpersonal communication that has been studied this way. Jennings (1952), for example, tries to trace the transmission process by which relevant knowledge about girls running for election was spread among the 400 occupants at the New York State Training School for Girls. Jennings puts the problem this way: "Without a certain minimum publicity being spread to others by those who know and approve the individual's 'way of leading,' no individual can have a leadership position beyond his immediate interrelationships." She observes that the mechanism for publicity of this sort is the immediate friendship group—"an interpersonal structure where the uniqueness of the individual as a personality is appreciated. . . . "[4] Now, when the overlap of these groups is extensive, that is, to the extent that individuals belong to more than one such group, there will be considerable shared knowledge; but we are told, where it is not well developed, shared knowledge will be restricted. Festinger's finding that rumors do not usually travel outside of self-contained clique structures is another way of expressing this same observation.[5]

An approach which examines *variations* of structure in the small group and the effect these have on the character of communications can also be singled out

[1] Festinger, Schachter and Back (1950), Chap. 7.

[2] For an interesting discussion of these networks and their relationship to both flow-of-influence and individual and group action, see Moreno's (1953) statement, pp. 440–450.

[3] Festinger, Schachter and Back (1950), pp. 125–127.

[4] Jennings calls this the "psyche group," contrasting it with a larger, more goal-oriented, more formally organized "socio group." The "psyche group" would seem to correspond, generally, to our idea of the primary group.

[5] Festinger, Schachter and Back (1950), p. 127.

from the prolific work of Festinger and his associates. Here the key variable is the degree of group cohesiveness; and cohesiveness, one might say, is the cement of sociometric structure. In an experiment by Kurt Back (1952) . . . we learn that when people are more attached to each other, they exert greater influence over each other's opinions and, moreover, are more effective in their influencing. Thus, it will be recalled, when the groups were highly cohesive, the number of attempts at changing a partner's opinion were both greater in number and more successful than when the interpersonal relations were less cohesive. Similarly, the Westgate study demonstrates that there is greatest uniformity of opinion in those residential courts that are most cohesive, thus implying that there is more, and more effective, communication among the members of these courts.[6] Cohesiveness in this case was judged from the allocation of intra-court friendship choices.

In addition to friendship channels, there are of course other sorts of interpersonal channels. Back, *et al.* (1950), for example, studied the processes of rumor transmission in an industrial organization. The factory's hierarchy consisted of five levels and a total of 55 members. Information was obtained from the director and from several others about the formal and the informal structures that existed within the organization, and on the basis of this information, a small number of strategically placed "cooperating observers" were recruited by the experimenters. These observers were pledged to secrecy regarding their part in the study and were instructed to make a careful record of the content and the transmission channels of every rumor—planted one at a time by the experimenters over a four month period—that was passed on to them or that they overheard being told to others.[7] In this way, there were recorded 17 acts of communication resulting from several rumors whose content related to the entire organization. Of these, 11 were directed upward in the status hierarchy, four were directed to peers in the hierarchy, and only two communications were directed downward.

This study, it is important to remember, is concerned with informal communication patterns in the setting of a highly formal organization. It is interesting to speculate whether these upward-directed acts of informal communication reflect the more formally prescribed work-interaction patterns, or mobility aspirations, or perhaps, friendship patterns which cross status lines. To what extent

[6] *Ibid.*, p. 92.

[7] By interviewing the entire membership of the organization at the end of the experimental period, the authors were able to ascertain that these cooperators had failed to record only 22 per cent of the communications that occurred; in other words, this method yielded 78 per cent of the desired information.

In general, there was not a great deal of communication concerning these rumors. The authors discuss several reasons for this, including their suspicion that the cooperators themselves—who were chosen because of their key locations but who were not permitted to pass on anything they heard—may under ordinary circumstances have been important transmitting agents. Back's brief discussion of the assets and liabilities of several of the methods that have been used, or might be used, for the study of rumor transmission is very valuable.

would communications which are not directly relevant to the organization—say, communications about presidential elections, or World Series scores—flow in the same way? To what extent do communications between, say, social classes in a community or between more and less prestigeful members of a small group parallel this case of the factory? [8]

All these are questions for which we do not have simple answers. But since we are concerned specifically with communication in informally organized small groups, perhaps we should attempt, at least, to place these problems in the small group context. If we ask whether communication even in small groups tends to be directed upward (from lower status to higher status members), the answer seems to be yes—but the yes needs considerable elaboration. Homans' analysis of this matter, for example, leads him to suggest, first, that "any single person interacts most of all with his equals." [9] At the same time, however, the higher a person's status, the more people will seek to communicate with him. In other words, higher ranking individuals are targets for communications from those below them in rank. Homans adds that these high ranking members, in turn, tend to address themselves to a larger number of group members than to lower ranking individuals.[10] Bales' studies at Harvard seem to corroborate these observations, though it is not quite clear to what extent his findings—which are based on discussion groups and problem-solving conferences—are generalizable to the more informal influencing that goes on between friends and neighbors, husbands and wives, workers on the job, etc.[11] Using a device for recording interaction, Bales

[8] These questions, of course, are raised again in later parts of this book. Specifically, it is asked whether interpersonal influencing in an urban community tends to take place between individuals of like status (or age, or gregariousness) or between individuals of differing status. And, again, it is asked whether the channels of interpersonal communication on one subject—say, fashions—are the same as those employed for another subject—say, politics. See Part Two, Section Three. Later parts of the present chapter, too, treat the question of multiplicity of channels (see the "situational" aspects of communications, p. 94 ff. and p. 100 ff.). For discussion of content factors in upward and downward communication in informal organizations, see, e.g., Homans (1950), particularly p. 461, Kelley (1950), Thibaut (1950). These latter two are important studies of the relationship between membership in one or another of several hierarchically arranged groups (experimentally induced) and the frequency and content of communications behavior.

[9] Homans (1950), p. 184.

[10] *Ibid.*, pp. 182–183. In Homans' own words: "The higher a man's social rank, the larger will be the number of persons that originate interaction for him, either directly or through intermediaries . . . (and) the larger the number of persons for whom he originates interaction, either directly or through intermediaries." Authority for substituting "communication" for "interaction" will be found, *Ibid.*, p. 37.

[11] Bales (1952) summarizes major findings from his studies which seek to describe uniformities of the following three kinds: (1) "Profile"—the relative frequency of different sorts of substantive acts during the course of a discussion—the ratio of questions to answers, for example; (2) "Phase Movements"—the distribution through time of the group's attention to three qualitative areas of discussion, namely, Orientation (what is it),

is able to show that if the members of a group are ranked in order of the frequency with which they speak to others, then it turns out that this same rank order holds for the frequency with which others speak to them. But the most frequent speakers tend to address themselves to the entire group; indeed, it turns out others tend to talk to them as individuals, but their own talk is more often directed to the group as a whole. Furthermore, it is important to note, popularity in the group is also distributed according to the rank order of frequency of speaking, so that the most frequent speakers are also most popular. It follows that person-to-person messages are directed at the most popular group members and thus may be said to move upward in the hierarchy, while communication from one person to several others tends to flow down.

To his analysis of the direction of flow, Bales adds an analysis of content. It becomes evident that the high ranking people—those who are most popular and most frequent talkers—are also likely to say different things than the low ranking people: The former tend to offer information and proffer opinion, while the latter typically request information and opinion, and express agreement or disagreement. The infrequent speakers, in other words, tend to "react" rather than "initiate," while the more frequent speakers seem to make more influence-attempts.

These studies show that social stratification—status and rank—plays an important part in channeling communications flow in small, informal groups, just as it does in more formally organized groups. But now that we have seen something of the influence of formal and informal hierarchies and of mutual attractions (friendship, cohesiveness) in making for variations in the networks of interpersonal communication, let us consider the consequences for communications behavior of another of the important dimensions of group structure: group size. Again, Bales talks to our point. As groups get larger (in this case, ranging from 3 to 8 people) he finds that more and more communication is directed to one member of the group (the most frequent communicator), thus reducing the relative amount of interchange among all members with each other. At the same time the recipient of this increased attention begins to direct more and more of his remarks to the group as a whole, and proportionately less to specific individuals. "The communication pattern," says Bales, "tends to 'centralize,' in other words, around a leader through whom most of the communication flows." [12]

But though the discussion in the larger group tends to focus more around one individual, it does not necessarily follow that the degree of consensus achieved will be greater. Quite the contrary, according to one experiment on this subject, which compared five-man and twelve-man discussion groups.[13] The dis-

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Evaluation (how do you feel about it) and Control (what shall we do about it); and (3) "Who-to-Whom Matrix"—who says what and how often to whom.

[12] *Ibid.*, p. 155.

[13] Hare (1952).

cussants were Boy Scouts who came together to iron out differences in opinion regarding the relative merits of various types of camping equipment, and it was found that the five-man groups achieved a significantly greater degree of consensus than the twelve-man groups. Furthermore, the author reports—on the basis of a questionnaire—that there was greater dissatisfaction with the meeting expressed among members of the larger groups. There is evidence, too, that the dissatisfaction was due to the lower level of participation that was imposed on the larger groups by the time limit. This leads the author to suggest that lowered participation results in lowered consensus.[14]

Here, then, are a few brief illustrations of the ways in which different structural "arrangements" affect the patterns of interpersonal communication. In our discussion of the strategic points of communication below, we shall return to a consideration of how "location" within a given communication structure constitutes one of the major keys to the study of strategic communications roles— particularly those of leaders and influentials. The concept of "centrality," which has already been touched upon, will be found to play a major role.

Comparative climates: group culture and communications

The idea that varying the links between the members of small groups might also result in significant variations in the patterns of communications flow, the volume of communication and even the content has occurred to different researchers in different ways. The studies we have just finished reporting were primarily concerned with the structure of the group. Here we shall turn to consider the effects on interpersonal communication of varying the "climate," or "culture," within which a group of individuals meets, and the first study we shall report is a well-known one by Kurt Lewin and his associates.

Together with Ronald Lippitt and Ralph K. White, Lewin set up what is perhaps his most famous experiment—that on "experimentally created social cli-

[14] This same study informs us that leaders in the large groups had less influence over the opinions of their groups than leaders of the small groups. Confronting this finding with Bales' report that leaders in larger groups tend to command a position of "centrality" in the communications channels of their groups, seemingly we are led to the conclusion that as the leader gains in centrality he loses in influence. As we shall see later below (p. 108 ff.) when we consider the relationship between social "location" and influence, this is not necessarily so. Intuitively, we may suggest that the extent to which there is a "pressure toward uniformity" in the group—that is, the extent that members are dependent on each other for the solution of some problem, or the attainment of a goal—is an important variable here. In the present experiment, a group vote was required, but there was no call for unanimity, or what's more (and this is a point we shall see illustrated below) no interdependence among group members was required insofar as obtaining an "answer" was concerned. Our suspicion is, therefore, that where there is strong pressure toward uniformity and/or considerable interdependence the more central role of large group leaders is also more influential, whereas under conditions where there is little pressure toward uniformity, the influentiality of the large-group leader is reduced.

mates": "democratic," "authoritarian" and "laissez-faire." [15] We shall not enter into a detailed discussion of the experimental design, except to indicate that each of four matched clubs of 11-year-old children were subjected, in varying sequences, to each of the three "climates," and that these "climates" were determined primarily by the carefully rehearsed behavior of the adult group leader. Moreover, the variations that might be products of the leader's personality were controlled by assigning more than one group to each leader and making him responsible for creating more than one kind of "climate." Each club met in the same clubroom setting and each engaged in the same activity. Records of all kinds were kept, including a minute-by-minute analysis of subgroupings, a quantitative running account of the behavior of the adult leader and of all group interaction, and a continuous stenographic record of all conversations.

Although this study was not formulated by its authors in terms of communications problems, many of its results will be of direct import for us. We learn, for example, that the sheer volume of conversation among group members was more restricted in the authoritarian atmosphere [16] than in the democratic or the laissez-faire situations.

The more interesting communications data, however, must be described in somewhat more substantive terms. Thus, in the authoritarian groups there were more attempts to attract and hold the leader's attention, although the character of the interaction with the leader was relatively less confiding and less "personal." In the democratic and laissez-faire atmospheres, on the other hand, members made more requests for attention and approval from fellow members than in the authoritarian climates. The laissez-faire groups exceeded the other groups by far in the category of requesting information of the leader, while the democratic groups were freest of all in making suggestions to the leader about group policy.

This evidence implies that the democratic group, by virtue of the processes of interchange and decision which were part of its group "climate," probably went much further than the other groups in establishing group-enforced norms of behavior, independent of the adult leader. The pattern of communication determined by the democratic "climate," in other words, did not center exclusively on the leader. This interpretation seems to be supported by the results of one of the "test episodes" in this experiment, whereby the leader was summoned from his group unexpectedly, and the reaction, in each "climate," to the leader's sudden departure was observed. When the leader left the authoritarian groups, the authors tell us, " 'working time' dropped to a minimum . . . and most of what was done was in the minutes just after the leader had left the room . . . (but) in the democratic atmosphere the absence or presence of the leader had practically no

[15] For a summary of these studies, see Lippitt and White (1952).

[16] Actually, the authoritarian groups did not all behave alike. Some behaved very aggressively during the experiment and others apathetically, but we shall not go into the details of this distinction.

effect." [17] Primarily, of course, this is evidence that the authoritarian groups depended completely on the leader's direction and lacked any sort of productive initiative except when the leader was present. Apparently, the group was not strictly a group—or at least a production group—except when cemented together by the leader. The democratic group, on the other hand, seemed to be able to function as an interacting goal-oriented unit without the adult leader. There seems to be evidence here that as a result of group-derived decisions which were the basis of the democratic group "climate," the group had transmitted to its members a set of shared "traditions" which became group property and were maintained even when the leader was absent.

Another climatic difference built into an experimental situation can be examined in Festinger and Thibaut's (1952) study of the effect of varying the "pressure toward uniformity of opinion." We know, for example, that some cultures more than others demand unanimity of opinion in their members; and we know, too, that even a single group in a single culture experiences some situations as permissive and others as demanding, as far as homogeneity of opinion is concerned. The authors "created" three different kinds of experimental "climates." One set of groups was told that the experimenter's interest was in observing "how a group went about coming to a unanimous decision." Thus, a "high" pressure toward uniformity of opinion was induced in these groups. A second set of groups was informed about the solution that some experts had proposed for a particular problem and were told that the group would be rated according to the number of its members who arrived at the "correct" solution; these instructions were designed to introduce "medium" pressure toward uniformity. The third set of groups was merely informed that the experimenter wanted to study a problem-solving group, and thus no external pressure toward uniformity was introduced. The results of the study clearly demonstrate the authors' hypothesis that "as pressure toward uniformity increases, both pressure to communicate and readiness to change also increase. Since both of these factors are conducive to change, there should be increasing change toward uniformity of opinion as the pressure toward uniformity increases."

By means of these studies we have tried to show that the "climates" or "cultures" within which individuals find themselves, influence the patterning of interpersonal communication. Like the structural characteristics of interpersonal relations, "climatic" characteristics must be accounted for if we are properly to analyze the varied character of the channels of flow of information and influence among interacting individuals.

SITUATIONS: COMMUNICATIONS CONTENT AND INTERPERSONAL RELATIONS

Individuals in modern society are usually members of more than one group, and have interpersonal ties in different sorts of situations. Groups of individuals,

[17] Lippitt and White (1952), p. 348.

furthermore, share certain interests on the level of the group as a whole, and divide into sub-groups, as far as certain other interests are concerned. Therefore, the very same group may engender quite different communications networks relative to different interests and different situations. Important questions emerge from this situational approach to interpersonal relations: How do communication patterns change in different social situations? What kinds of communication content flow through which kinds of interpersonal networks? For example, is the family group important in generating or transmitting political opinions or is it the work group—and for which kinds of people?

Because most small-group studies are conducted in laboratories, there are very few answers for this kind of question in actual research reports. Some leads, however, are available to us, notably from those who have stepped outside the confines of the small-group laboratory to study "natural" groups.

The cardinal principle that emerges from all work in this area is that shared interest in a given subject is the basis for interpersonal networks of communication. In other words, as Allport and Postman (1947) put it in their study of rumor, "A rumor public exists wherever there is a community of interest." For example, financial rumors circulate among those who are likely to be affected by financial ups and downs.[18] Festinger and his associates (1950) provide several illustrations for this principle in their studies of housing communities.[19] When a rumor concerning the future of the children's nursery school was circulated, these investigators were able to ascertain that it had reached 62 per cent of the people in the community with children of nursery school age, and only 28 per cent of the people who had no children of that age. When a rumor hostile to the existence of the Tenants' Council was "planted" in Westgate, it tended to reach people who were particularly associated with the organization and among those who heard it, it was passed on, in turn, only by those who were active participants in the organization, or who were members of a family with active participants, but not at all by any others. Similarly, in the study of "planted" rumors in an industrial organization, Back et al. (1950) find that when a rumor pertained specifically to a small group, it tended to spread very quickly to the members of that group and not to go beyond the few people who were vitally concerned.

Here, then, it appears that networks of communication exist not only within the web of friendship networks but within the web of shared interests and concerns as well. Festinger et al. (1950), however, suggest several important amendments to this conclusion, though their proof for these is not quite conclusive. In terms of their Westgate study of attitudes toward a Tenants' Council, they tell us, first of all, that information favorable to the Tenants' Council was much more actively communicated within those residential courts whose members were favorable to the Council than those courts which were unfavorable. Secondly, they say

[18] Allport and Postman (1947), p. 180.
[19] Festinger, Schachter and Back (1950), Chap. 7.

that there seemed to be little or no communication on matters relevant to the Tenants' Council between members of courts which had conflicting court attitudes toward the Council. On a more abstract level, these findings seem to point to the generalization that there will be a greater amount of communication concerning a given matter among people who share a concern in the matter when (a) their point of view on a particular concern is homogeneous and (b) when the content of the communication is favorable to their shared point of view.[20]

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THIBAUT, JOHN (1950), "An Experimental Study of the Cohesiveness of Underpriviledged Groups," *Human Relations*, Vol. 3, pp. 251–278.

[20] Festinger, Schachter and Back (1950), p. 129. We are not told, however, that communications unfavorable to the Council were more actively spread in the unfavorable courts. Moreover, what we *are* told is that communications hostile to the Council spread most of all and most quickly to those who were active participants in the Council, most but not all of whom, we know, were favorable, too. That is one objection to the conclusions reported. A second objection stems from the inference that since rumors did not spread from the favorable to the unfavorable courts, or vice versa, that communication between groups with different standards is therefore limited. This cannot be conclusively demonstrated since groups with different standards tended also to correspond to different friendship cliques; hence it would be sufficient, therefore, to point out that communications were limited by friendship channels—something we have already been told.

TRADITIONS OF RESEARCH ON THE DIFFUSION OF INNOVATION

Elihu Katz, Martin L. Levin, and Herbert Hamilton

It is hardly news that the diffusion of innovation is one of the major mechanisms of social and technical change. Indeed, around the turn of the century anthropologists were greatly impressed with the significance of diffusion, even overly impressed. In sharp contrast to the European diffusionists,[1] however, the Ameri-

[1] Robert H. Lowie, *History of Ethnological Theory* contains an excellent treatment of the early anthropological movements and schools, including evolutionism and diffusion. In this connection also see Alexander Goldenweiser's "Cultural Anthropology" in Harry Elmer Barnes (ed.), *History and Prospects of the Social Sciences*, New York: Alfred A. Knopf, 1925. A. L. Kroeber's article "Diffusionism" in the *Encyclopedia of the Social Sciences* is a brief, interesting description of the early diffusionist work in the context of the development

cans avoided grand, all-embracing theories of cultural development. Instead they worked modestly, investigating rather specific items—elements of the maize-complex, the horse-complex, the sundance—tracing their distribution in space and, insofar as possible, in time. The work remained primarily historical and descriptive, although some important generalizations about the generic aspects of diffusion were advanced.[2]

Influenced in part by these anthropologists, several empirically minded sociologists of the 1920's and 1930's also demonstrated an interest in diffusion.[3] Studies were made of the spread of the city-manager plan, of a third-party movement, of amateur radio as a hobby, and the like. The guiding theoretical concerns had to do with the influence of the metropolis on its satellites, the effectiveness of natural and legal boundaries as barriers to diffusion, the flow of innovation from region to region across the country, as well as the hypothesis of a "concentric circle" pattern of diffusion which was shared with the anthropologists. The underlying assumption was always that informal communication among adopters was the key to diffusion.

In both of these fields, diffusion studies came to a halt by about 1940.[4] In

of anthropology, and Melville Herskovits, *Man and His Works*, Chapters 30 and 31, New York: Alfred A. Knopf, 1938, can also be examined with profit as an informative survey of the various early movements in anthropology. For various sides of the argument concerning the early work on diffusion see G. Elliot Smith, *et al.*, *Culture: The Diffusion Controversy*, New York: Norton, 1927.

[2] Among the more suggestive of these studies for our purposes are the following: Robert H. Lowie, "Plains Indians Age Societies," *Anthropological Papers*, American Museum of Natural History, 11 (1916), pp. 877–1031; Robert H. Lowie, "Ceremonialism in North America," *American Anthropologist*, 16 (October-December, 1914), pp. 602–631; Paul Radin, "A Sketch of the Peyote Cult of the Winnebago: A Study in Borrowing," *Journal of Religious Psychology*, 7 (January, 1914), pp. 1–22; Leslie Spier, "The Sun Dance of the Plains Indians: Its Development and Diffusion," *Anthropological Papers*, American Museum of Natural History, XVI (1921), pp. 451–527; Clark Wissler, "Material Culture of the North American Indians," *American Anthropologist*, 16 (October-December, 1914), pp. 477–505; Clark Wissler, "Costumes of the Plains Indians," *Anthropological Papers*, American Museum of Natural History, 17 (1915), pp. 39–91; Clark Wissler, "The Ceremonial Bundles of the Blackfoot Indians," *Anthropological Papers*, American Museum of Natural History, VII (1914), pp. 65–289.

[3] See, for example, Raymond V. Bowers, "The Direction of Intra-Societal Diffusion," *American Sociological Review*, 2 (December, 1937), pp. 826–836; F. S. Chapin, *Cultural Change*, New York: Century, 1928; Edgar C. McVoy, "Patterns of Diffusion in the United States," *American Sociological Review*, 5 (April, 1940), pp. 219–227; H. Earl Pemberton, "Culture Diffusion Gradients," *American Journal of Sociology*, 42 (September, 1936), pp. 226–233.

[4] In the 1920's and 1930's, a method of diffusion research commonly referred to as "age-area" analysis was developed. This method involved reconstructing the temporal movement and spread of cultural traits and complexes from geographic data on the spatial distribution of the cultural elements under investigation. Especially noteworthy in this regard was the work of Clark Wissler, who developed it to its most refined degree. See his *Man*

anthropology, attention shifted to the closely related problem of acculturation[5] in which emphasis is placed on ongoing (rather than historical) situations of intergroup contact, on patterns of culture traits rather than single items and, typically, on pairs of interacting societies rather than longer chains of connected groups.[6]

It is less clear why diffusion studies failed to hold the interest of sociologists, though they were never as prevalent as in anthropology. It seems a reasonable guess, however, that the revolution in communication which began with the rapid spread of radio in the late 1920's and early 1930's diverted their attention.

THE REVIVAL OF INTEREST IN DIFFUSION RESEARCH

But the mass media are incapable of influencing people (though they may inform them) as directly or as simultaneously as had been imagined.[7] Indeed, the study of mass media "effects," with its primarily psychological bias, is now broadening to take account of the *social* processes involved in the spread of influence and

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and Culture, New York: Thomas Y. Crowell Co., 1923, and *The Relation of Nature to Man in Aboriginal America*, New York: Oxford University Press, 1926. While a very important contribution to the field in its day, this approach was subjected to a searching critique by Roland Dixon in *The Building of Culture*, New York: Scribners, 1928. This kind of criticism, no doubt, contributed appreciably to the subsequent decline of distributional diffusion studies generally. Still, there has been a continued production of such studies and, indeed, one occasionally encounters especially interesting investigations at least partly employing this approach, such as the recent work by David F. Aberle and Omer C. Stewart, "Navaho and Ute Peyotism: A Chronological and Distributional Study," *University of Colorado Studies*, Series in Anthropology No. 6, 1957. Furthermore, those interested in archaeology seem to have maintained an even more central concern for diffusion analysis along these distributional lines. See, for example, the spirited discussion of the paper by Munro S. Edmondson, "Neolithic Diffusion Rates," *Current Anthropology*, 2 (1961), pp. 71–102.

[5] Acculturation or culture contact studies were heralded by Robert Redfield, Ralph Linton and Melville J. Herskovits, in their "Memorandum on the Study of Acculturation," *American Anthropologist*, 38 (January-March, 1936), pp. 149–152.

[6] Indeed, a large segment of diffusion studies has tended to concern itself with adjustive responses to contact rather than the transmission of items between groups. This paper will explicitly avoid consideration of the now predominant concern with the social and cultural consequences of change. Our focus is on the processes of *communication* of change. Studies concerned with non-diffusion aspects of change are helpful, however, in drawing attention to the interrelationships among diffusion processes, socialization processes and adjustive processes in culture change. For an interesting empirical study illustrative of the link between socialization processes and (resistance to) acculturation, see Edward M. Bruner, "Primary Group Experience and the Processes of Acculturation," *American Anthropologist*, 58 (August. 1956), pp. 605–623.

[7] For a discussion of some of the social and psychological factors involved in the transmission of influence via the mass media, see Joseph T. Klapper. *The Effects of Mass Communication*, New York: Free Press, 1960, Part One.

innovation.[8] This seems an altogether reasonable next step for former students of mass media "campaigns." For, if the mass media are not as all-powerful as was originally imagined, the problem of understanding the furious rate at which new ideas and behavior travel through society still remains. In short, there is a revival of interest in diffusion processes.[9]

The sociologists of communication who found themselves interested in diffusion discovered, somewhat to their surprise, that relevant studies were being carried on in a number of closely related fields. The most conspicuous case is that of rural sociology which has accumulated, over the last two decades, several hundred studies of the communication and acceptance of new farm practices.[10] Similarly, researchers in the field of education have tried to understand the rate of acceptance of innovations by school systems and have looked at such things as the spread of the kindergarten or supplementary reading.[11] Public health is interested in the acceptance of new health practices—the Salk vaccine, for example.[12] Marketing researchers, of course, are interested in the spread of acceptance of new products (although they have done far less work on this problem than one might imagine); [13] folklorists have documented the extent to which children's games, for example, have spread from region to region; [14] and so on. Like sociology, anthropology has also experienced something of a return to some

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[8] The design of research in mass communication has recently begun to take account of interpersonal relations as structures which relay and reinforce (or block) the flow of influence and innovation. See Elihu Katz, "The Two-Step Flow of Communication: An Up-to-Date Report on an Hypothesis," *Public Opinion Quarterly*, 21 (Spring, 1957), pp. 61–78.

[9] In the few relevant studies so far, the tendency has been to follow a communication as it passes from one individual to the next, to establish the nature of the relationship between the interacting individuals and thus to infer the relevant social networks; in other words, structures of social relations are derived from the flow of interpersonal communication. The alternative method—that of mapping the potentially relevant structures of social relations *prior* to tracing the flow of influence—would seem to be somewhat more desirable, if more difficult.

[10] For an overview of work in this field together with selected bibliography, see Herbert F. Lionberger, *Adoption of New Ideas and Practices*, Ames, Iowa: Iowa State University Press, 1960.

[11] See Paul R. Mort and Frances G. Cornell, *American Schools in Transition*, New York: Teachers College, Columbia University, 1941; and Walter Cocking, "The Regional Introduction of Educational Practices," New York: Bureau of Publications, Teachers College, Columbia University, 1951.

[12] For numerous references, see Steven Polgar, "Health and Human Behavior: Areas of Interest Common to Social and Medical Sciences," *Current Anthropology*, 3 (April, 1962), pp. 159–179, particularly the section on Health Action Programs and, to a certain extent, the section on Dynamics of Health Status. Anthropologists have been particularly active in this area.

[13] The most interesting study, from our point of view, is *The Tastemakers* (Vol. I), a report of the Public Opinion Index for Industry, Princeton, New Jersey: Opinion Research Corporation, April 1959.

[14] See, for example, Iona and Peter Opie, *The Lore and Language of Schoolchildren*, London: Oxford University Press, 1959.

of the interests of the more sober schools of diffusion, as a by-product of the current effort to evaluate the progress of the varied programs for planned change in underdeveloped areas of the world.[15]

THE STATE OF DIFFUSION RESEARCH

Ironically, it almost seems as if diffusion research in the various research traditions can be said to have been "independently invented!" Indeed, diffusion researchers in the several traditions which we have examined scarcely know of each other's existence. The recent "discovery" of rural sociology by students of mass communications and vice versa is a good case in point.[16] As a result, each tradition has emphasized rather different variables and a characteristically different approach. This paper attempts to integrate these diverse points of view.

To accomplish this, we shall first propose a working conception of diffusion from a sociological point of view. This will be done in terms of a tentative set of component elements, each of which can be formulated as a key variable (sometimes as several variables) intrinsic to, or bearing upon, the diffusion process. Taken together, they constitute a kind of "accounting scheme" for the study of diffusion.

Following the enumeration of the component elements, each will be considered in some detail, paying particular attention to problems of conceptualization and operational definition. Then, we shall attempt to "locate" the characteristic emphases of each of the research traditions in terms of one or more of these elements of the diffusion process.

DEFINING DIFFUSION

Viewed sociologically, the process of diffusion may be characterized as the (1) *acceptance*, (2) over *time*, (3) of some specific *item*—an idea or practice, (4) by individuals, groups or other *adopting units*, linked (5) to specific *channels* of communication, (6) to a *social structure*, and (7) to a given system of values, or *culture*.

[15] There is a burgeoning literature on this subject. See the studies reported in recent volumes of *Human Organization and Economic Development and Cultural Change*; the several collections of case studies, particularly Benjamin Paul (ed.), *Health, Culture and Community*, New York: Russell Sage Foundation, 1955; and recent volumes such as Charles Erasmus, *Man Takes Control*, Minneapolis: University of Minnesota Press, 1961; and George M. Foster, *Traditional Cultures and the Impact of Technological Change*, New York: Harper, 1962.

[16] For an account of the confrontation between students of mass communication and of rural sociology, see Elihu Katz, "Communication Research and the Image of Society: Convergence of Two Traditions," *American Journal of Sociology*, 65 (March, 1960), pp. 435–440.

Altogether, there are very few studies in any of the traditions of diffusion re-search which have incorporated *all* of these elements. In fact, the traditions differ from each other precisely in their tendency to "favor" certain of the elements rather than others.

Now we shall consider each of the components in turn.

1. ACCEPTANCE.   Acceptance is the dependent variable in most studies of diffusion though, strictly speaking it is time-of-acceptance that is really of interest. Ideally, in other words, diffusion studies seek to classify acceptors in terms of the timing of their acceptance of an item or to compare the relative rate of acceptance in one community with another. More often than not, however, information about time is lacking and, instead, one learns—for a given point in time—which in-dividuals have and have not accepted an innovation or what proportion of com-munity members in different communities have accepted.

Most diffusion studies define acceptance rather arbitrarily. Where informa-tion on time is available, date of "first use" is frequently employed as the measure of acceptance, the season of first-use of hybrid corn, for example.[17] But, obvi-ously, first-use may or may not be followed by continued use and some recent studies, therefore, have insisted on the distinction between "trial" and "adoption." Thus, a measure of "sustained use" might be appropriate for some purposes but, for other purposes, it may be of interest to consider only "ever use." [18]

For anthropologists, however, this is a much more serious matter. First of all, anthropologists tend to be skeptical about the extent to which a given item is perceived and used in the same manner in different societies. If the sewing machine is prominently displayed on the open porch, but never used for sewing, it may be argued that it is no longer the "same" item. For anthropologists, that is, acceptance tends to refer not to the form of an item alone but to form-mean-ing-function.[19] Consider the acceptance of Christianity, for example, as discussed in the anthropological literature. With respect to its appearance in a given society, anthropologists would tend to ask: (1) Is it the "same" item? (2) Is it inter-nalized in the personalities of the group? (3) Is it central to the social institu-tions of the group? Indeed, one of the factors underlying the distinction between "acculturation" (a prestigeful concept) and "diffusion" (a less prestigeful one)

[17] See Bryce Ryan and Neal Gross, "The Diffusion of Hybrid Seed Corn in Two Iowa Communities," *Rural Sociology*, 7 (March, 1943), pp. 15–24.

[18] Gaining acceptance for most contraceptive techniques, for example, is much more a problem of "sustained use" than of "first use." See Reuben Hill, J. Mayone Stycos and Kurt Back, *The Family and Population Control*, Chapel Hill: University of North Carolina Press, 1959. Obviously, the distinction is appropriate wherever first use does not lead directly to continued use. See A. Apodaca, "Corn and Custom," in E. H. Spicer (ed.), *Human Problems in Technological Change*, New York: Russell Sage Foundation, 1952, for a study of the accept-ance of an innovation which was later discontinued.

[19] The form-meaning-function distinction is stressed particularly in Ralph Linton, *The Study of Man*, New York: Appleton-Century, 1936, pp. 402–404.

in anthropology, appears to be related to the "level" of acceptance (internaliza-
tion and centrality) involved.[20]

. This is a good example, perhaps, of the utility of confronting several tradi-
tions with each other within a manageable framework. Obviously, some kind of
distinction must be made between mere external acceptance of a form and its
internalization; and, obviously, attention must be given to the extent to which
function travels together with form. But these ideas should not be treated merely
as *cautionary*; they are also suggestive of hypotheses. Indeed, writing in a very
similar vein, Gabriel Tarde—the social theorist of diffusion *par excellence*—sug-
gested that "inner" changes precede "outer" changes in the sense that the diffu-
sion of an idea precedes the diffusion of the tangible manifestation of that idea
or, in other words, that there is a "material lag" rather than a "cultural lag" in
the transfer of items across societal boundaries. Some theorists would agree;
others, obviously, would not.[21] In any case, the implication is that diffusion re-
search ought not to be misled by the argument over whether "mere diffusion" or
penetration to deeper levels is more important but, rather, whether these corre-
spond to separable episodes in the spread of any given item and, if so, how they
are related.

2. TIME.   If any one of the elements may be said to be more characteristic
of the diffusion process than the others, it is time. It is the element of time that
differentiates the study of diffusion both from the study of mass communication
"campaigns" with their assumed immediacy of impact and from traditional dis-
tributional studies. Diffusion takes time; for example, it took ten years for hybrid
corn—an unusually successful innovation—to reach near-complete acceptance in
Iowa communities. Nevertheless, there are very few studies, so far, that have
taken systematic account of time in the study of diffusion.

In part, this neglect is a result of the difficulty of obtaining data. Studies
which have taken account of time have relied on one of the following three
methods: *recall* (where a respondent, or an informant, dates the acceptance of an
innovation), *records* (where time-of-acceptance is a matter of record, for some
reason), and *inferences* (such as in the archaeological dating methods of stratig-
raphy or Carbon-14).

Some of the early diffusion studies by sociologists had access to data on time
because they studied innovations intended for adoption by municipalities—the
city manager scheme, for example.[22] A current study of the diffusion of fluorida-

[20] For good examples of the applicability of the notion of levels of incorporation of an
innovation into a receiving society, see Edward P. Dozier, "Forced and Permissive Accultura-
tion," *American Indian*, 7 (Spring, 1955), pp. 38–44; and Edward H. Spicer, "Spanish-Indian
Acculturation in the Southwest," *American Anthropologist*, 56 (August, 1954), pp. 663–678.

[21] In his analysis of the sun dance, Spier explicitly cites his data as evidence, at least
in this case against Tarde. See Leslie Spier, *op. cit.*, p. 501.

[22] See, for example, McVoy, *op. cit.*

tion has such data for the same reason.[23] The dates of acceptance of such innova-
tions are a matter of public record.

Anthropologists who were studying diffusion in the 1920's and 1930's gave
considerable thought to the development of a methodology for inferring time from
spatial distributions. Clark Wissler, for example, was able to demonstrate that a
particular distribution of pottery around a hypothesized point of origin did, in-
deed, correspond to a known succession of types of pottery as established strati-
graphically.[24] Wissler further indicated that "students of culture generally assume
that widely distributed trait complexes are the older," though he immediately cau-
tions that such an assumption may result in serious error insofar as the rates of
diffusion of different sorts of items may vary.

Early sociological students of diffusion faced a similar obstacle though they
had more data on time. It is relatively easy to establish, for example, the date on
which 10 percent of the population of a city or state owned a refrigerator or a
radio. Then, treating the city or the state as if they were "adopters" of refrigera-
tors and radios makes it tempting to suggest that certain cities are influencing
others to adopt or that there seems to be a certain kind of geographical move-
ment from state to state. A genuinely pioneering (though perhaps unconvincing)
effort to strengthen this sort of tenuous ecological analysis with data gathered
from individuals was made by Bowers in the 1930's.[25] Bowers studied the diffu-
sion of amateur radio as a hobby and demonstrated, for example, that the propor-
tion of amateurs to population was at its highest in 1914–1915 in cities of
25,000–100,000; five years later the peak was in cities of 10,000–25,000; during
the following five years, the heaviest concentrations were in still smaller cities.
From this distribution, he infers that people in the larger cities had influenced
those in smaller places. Then, by means of a mail questionnaire, an attempt was
made to test this inference by asking licensed amateur radio operators to report
on the sources which were influential in their decisions to become "hams."

If students of pre-history sorely felt the lack of data on time, it is a nice
anomaly that students of "consumer" innovations in the mid-twentieth century are
experiencing the same problem. It may be possible to ask a farmer to try to recall
the season during which he first planted hybrid corn, but it is very difficult to be
certain that such information is reliable. How much more is this the case for
innovations which are less central to their adopters and inherently less datable
than is the season of first use of a new kind of seed. One can perhaps ask about

23 See Robert L. Crain, "Inter-City Influence in the Diffusion of Fluoridation," unpub-
lished Ph.D. dissertation, Department of Sociology, University of Chicago, 1962.

24 See *Man and Culture, op. cit.* Also see the work of Margaret T. Hodgen, "Geographi-
cal Diffusion as a Criterion of Age," *American Anthropologist,* 44 (1942), pp. 345–368. The
article by Edmondson, *op. cit.,* is based on Carbon-14 datings.

25 See Bowers, *op. cit.*

the date of purchase of major appliances, but it is almost impossible to rely on recall for most other things. A promising source for data of this kind is the type of consumer panel in which households are asked to keep a record of all their purchases, entering them in some sort of log on a daily or weekly basis; however, there are many difficulties with this procedure.[26] Occasionally, unusual opportunities present themselves for obtaining data on adoption dates. The study of the diffusion of new drugs among physicians, for example, had access to prescriptions on file in local pharmacies, making it possible to date each doctor's first use of a new drug.[27]

Time is a crucial ingredient in the diffusion process, however, not simply because it enables the researcher to identify the characteristics of early-adopting individuals or to establish the direction of the flow of influence. It is also important because it provides a basis for the charting of diffusion curves, thus making possible the development of mathematical descriptions of variations in the diffusion process. Time, and the number of adopters at a given time, are continuous and easily quantified variables; hence, the study of diffusion is one of the areas of social science which lends itself immediately to the construction of mathematical models. For example, one can construct theoretical models of the diffusion process given certain assumptions and compare the results with those actually observed in the real world. On the basis of such a comparison, one can infer whether a given item is "contagious" or not, that is, whether the item spread as a function of the extent of previous adoptions or the character of contacts with previous adopters.[28] Hagerstrand, a geographer, was able to demonstrate that

[26] There is considerable difficulty in maintaining the representativeness of the consumer-panel sample, and constant programmed turnover is one of the strategies of doing so; for diffusion research, however, turnover represents a complication. Moreover, if one approaches the diffusion problem in a situation where individual adopters are widely dispersed—such as in a national study of some consumer innovation, for example—one must cope with the added complexity of differing beginning dates in different regions, etc.

[27] See James S. Coleman, Elihu Katz and Herbert Menzel, "The Diffusion of an Innovation among Physicians," *Sociometry*, 20 (December, 1957), pp. 253–270.

[28] An impressive amount of work is going on in this area, much of it beyond the competence of the present authors. The major contributions include the following: Stuart C. Dodd, "Diffusion Is Predictable: Testing Probability Models for Laws of Interaction," *American Sociological Review*, 20 (August, 1955), 392–401; and Stuart C. Dodd and Marilyn McCurtain, "The Logistic Law in Communication," in National Institute of Social and Behavioral Science, Symposia Studies Series No. 8, *Series Research in Social Psychology*, Washington, D.C., 1961; Melvin DeFleur and Otto Larsen, *The Flow of Information*, New York: Harper, 1958; Georg Karlsson, *Social Mechanisms*, Glencoe, Ill.: The Free Press, 1958; Torsten Hagerstrand, "Monte Carlo Simulation of Diffusion," University of Lund, Sweden, 1960 (unpublished); and James S. Coleman, "Diffusion in Incomplete Social Structures," Baltimore: Department of Social Relations, Johns Hopkins University, 1961 (unpublished). Two economists who have worked intensively with diffusion curves are Zvi Griliches, "Hybrid Corn: Explorations in the Economics of Technological Change," *Econometrica*, 25 (October, 1957), pp. 501–522; and Edwin Mansfield, "Technical Change and the Rate of Imitation,"

the most probable adopter of a new farm practice is the farmer living in the vicinity of someone who has just adopted it; and on the macro-level an innovation spreads from primary centers until the original source of influence is exhausted, whereupon some new center springs up.[29] Crain found essentially the same phenomenon at work in the case of fluoridation where the unit of adoption is a municipality rather than an individual.[30] Similarly, attempts have been made to specify, *a priori*, the probable influence of different patterns of social relations on the spread of innovation. The work reported by Stuart Dodd is a good example.[31] The same kind of logic suggests that similar innovations may be described by similar curves of diffusion and, if this is so, part of the problem of classifying innovations (to be discussed below) will be open to solution.[32]

   3. A SPECIFIC ITEM.   The discussion of acceptance has already made clear part of the problem of specifying the particular item under study. Obviously, one would like to ascertain whether the meaning of a given item for one individual, or for one society, is the same as it is for another. In a related sense, one would also like to know whether or not a given item is part of a larger "complex" of items to which it adheres. On the other hand, this does not preclude—as some people seem to think—the legitimacy of studying the diffusion of an isolated item, concentrating on form alone regardless of possible "adhesions" and regardless of possible variations in function. In any event, these problems are somewhat reduced when the items involved are practices more than ideas, items of lesser rather than greater pervasiveness, and when the study is concentrating on diffusion within a particular culture rather than across cultures. This, perhaps, makes somewhat clearer why anthropologists, more than others, have raised questions in this area.

   The major problem of specifying the item in diffusion research derives from these considerations. It is the problem of how to classify items so that the results obtained are generalizable to other items. This problem is not unique to diffusion research, of course, but it is perhaps particularly obvious in this context. Suppose one studies the diffusion of hybrid corn, or of fluoridation, or of 2–4–D weed spray. Unless some scheme of classification exists which would make it possible

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Pittsburgh: Graduate School of Industrial Administration, Carnegie Institute of Technology (unpublished). See also a noteworthy series of articles by bio-physicist Anatol Rapoport entitled, "Spread of Information through a Population with Socio-Structural Bias," *Bulletin of Mathematical Biophysics*, 15 and 16 (1953–54). Related work in the epidemiology of contagious disease is that of N. T. J. Bailey, *The Mathematical Theory of Epidemics*, London: Charles Griffin, 1957. Steven Polgar has written a paper that is relevant here on "The Convergence of Epidemiology and Anthropology," School of Public Health, University of California at Berkeley (unpublished).

   [29] Hagerstrand, *op. cit.*
   [30] Crain, *op. cit.*
   [31] Dodd and McCurtain, *op. cit.*
   [32] This is more difficult than it sounds, perhaps, but it is a lead worth following.

to say that a given new item is rather more like a 2–4–D weed spray than it is like hybrid corn, each study simply becomes a discrete case which cannot be generalized.

Such a classification system is particularly difficult because, like all "content analysis," one must make guesses about the meaning of the item to its potential audience. Of course, to a certain extent this can be studied empirically. Suppose, for example, that the dimension of "radicalness"—that is, the extent to which an innovation is a major departure from some previous mode of acting— were an important one, as many observers seem to think. One might pre-test the actual use of an innovation—a visual telephone, for example—to discover the kinds of behavioral and attitudinal changes which it implies in order to rank it, at least as perceived by its early users, on a radicalness scale.

But the trouble is that nobody is quite sure what dimensions of an item are relevant, and very little research has been done to try to find out. There are some exceptions, however. Wilkening in the United States and Emery and Oeser in Australia have traced the spread of several different agricultural innovations through the same communities and, on the basis of their differential rates and patterns of acceptance have speculated about some of the dimensions which affect diffusion.[33] A major study of the diffusion of educational practices also speculates about why different sorts of innovations seem to spread in different patterns.[34] Dimensions that have been suggested by these authors and others center on economic-sounding considerations such as (1) extent of capital outlay required; (2) extent of anticipated profitability; (3) certainty of profitability or efficacy, and extent of possible loss or danger (risk). Of course, these are not strictly financial matters at all.

The most promising works on this problem have been several attempts to explicate the most traditional of the dimensions in terms of which innovations have been classified: material vs. non-material items. Barnett and others have suggested that material items find more ready acceptance because (1) they are more easily communicated; (2) their utility is more readily demonstrable; and (3) typically, they are perceived as having fewer ramifications in other spheres of personal and social life.[35] Following Barnett, Menzel classified several different kinds of medical innovations in terms of his estimates of their (1) communicability, (2) risk, and (3) pervasiveness, hypothesizing that early adopters of each item would have certain characteristics.[36] He suggested, for example, that

[33] Eugene A. Wilkening, *Acceptance of Improved Farm Practices in Three Coastal Plains Communities*, Raleigh: North Carolina Agricultural Experiment Station, Bulletin 98, 1952; and F. E. Emery. Oscar Oeser and Joan Tully, *Information Decision and Action: A Study of the Psychological Determinants of Changes in Farming Techniques*, Carleton: Melbourne University Press, 1958.

[34] Mort and Cornell, *op. cit.*

[35] Barnett, *op. cit.*, pp. 374–377.

[36] Herbert Menzel, "Innovation, Integration and Marginality," *American Sociological Review*, 25 (October, 1960), pp. 704–713.

integration into the local medical community would be characteristic of early adopters of a new drug which "required" communication but neither risk nor pervasiveness, whereas acceptance of a psychotherapeutic technique would be likely to "require" a certain emancipation from the local community and thus lesser integration. The results obtained were promising and represent the opening up of an important direction for diffusion research.

4. UNITS OF ADOPTION.   Another way in which items can be usefully classified is in terms of the units of adoption for which they are intended. Most studies in sociology, rural sociology and marketing have considered only consumer-type items, those intended for adoption by an individual. But some innovations are intended for—indeed, they may "require"—groups, in the sense that it "takes two to tango" (or to telephone, or to perform the peyote ritual, etc.). And among such group-oriented innovations, a further distinction seems useful. There are items which require collective adoptions but permit any given individual to adopt or not (the telephone, for example) ; there are other items, however, where the group adopts as a single unit leaving no room for individual options (fluoridation, for example).

Just as the item may "require" one or another adopting unit, a given culture may "prescribe" one rather than another adopting unit as appropriate. The *kibbutz* prescribes a group decision even for consumer-type innovations intended for use by individuals; similarly, the simultaneous conversion of an entire village to Christianity reflects the acceptance of a corporate decision, made by the chief perhaps, as binding upon all. Anthropologists are much more likely than those in other traditions to focus on the group as an adopting unit. Sometimes, this is just another way of talking about individuals as, for example, when it is reported that Village A adopted a certain kind of plow but Village B did not. But, often, the group is indeed the unit of adoption in the sense that the group "decides," or the culture "prescribes," that there be a collective decision.

Thus, the unit of adoption may vary as a function of the "requirements" of the item or the "prescription" of the culture. And, just as in the case of the other elements in the diffusion process, the adopting unit functions as a variable to facilitate or block the flow of acceptance of innovation. For example, items which "require" collective adopting units may be resisted, therefore, by cultures which "prescribe," or favor, the individual as the unit of adoption and vice versa. Resistance to fluoridation, in the United States, in terms of minority rights is one such example; resistance to consumer innovations by Israeli *kibbutzim* is another. By the same token, an appeal for acceptance of an innovation is less likely of success when directed to the "wrong" adopting unit—as when family planning campaigns aim at, say, the wife, but the culture "prescribes," or the technique "requires," joint agreement by both spouses.[37]

5. CHANNELS.   So far, almost nothing has been said about the channels

[37] For further discussion of the points raised in this section, see Elihu Katz, "Notes on the Unit of Adoption in Diffusion Research," *Sociological Inquiry*, 32 (1962), pp. 3–9.

which transmit information and influence concerning an innovation. Indeed, except for occasional studies which noted the role of highways or of caravan routes, channels—like time—are missing in most of the early studies of anthropologists and sociologists. Even when it seemed certain, from distributional evidence or other inferences, that an innovation traveled from Tribe A to Tribe B, it was often unclear *how* this took place. On the other hand, if there is any single thing that is most wrong with contemporary studies of diffusion in the fields of mass communication, rural sociology and marketing research, it is that there is too much emphasis on channels. The typical design for research in these fields has been based, almost exclusively, on the assumption that people can be asked to recall the channels of information and influence that went into the making of their decisions to adopt an innovation or to make some sort of behavioral change. This approach in mass media research is known as "reconstruction" or "reason analysis." [38] It is of some methodological interest, too, because it reverses the usual experimental design of "campaign" studies which begin with stimuli and try to track down their effects. Reason analysis, instead, begins with an effect and seeks to reconstruct how it came about. It is this approach which is, in a sense, responsible for the rediscovery of the importance of interpersonal relations in the flow of influence and innovation in modern society. It is only very recently that students of mass communications and marketing have begun to include interpersonal relations among the channels of diffusion. This contrasts sharply with the rural sociologists who have long been aware—though they have not formulated it systematically until rather recently—that there is a "two-step flow" from the county agent to an influential farmer and thence to other farmers.

While a concern with channels is the predominant emphasis in several fields, it is a conspicuous lack in several others. Early anthropological studies, particularly those dealing with historical instances of diffusion, have been criticized for their (necessary, in part) lack of attention to process. Still, there were occasional studies pointing to probable means of transportation and communication such as Wissler's research on the horse in relation to the diffusion of Plains Indian culture traits [39] or the analyses of the role of roads and highways by various authors,[40] and there was even a noteworthy study of the personalities and roles

[38] For discussions of "reason analysis," see Paul F. Lazarsfeld and Morris Rosenberg (eds.), *The Language of Social Research*, Glencoe: The Free Press, 1955; and Hans Zeisel, *Say It with Figures*, New York: Harper, 1957.

[39] Clark Wissler's "The Influence of the Horse in the Development of Plains Culture," *American Anthropologist*, 16 (January-March, 1914), pp. 1–25, is the early classic paper on the role of "physical" means of transportation as a facilitator of diffusion. Also see the later study of Erna Gunther, "The Westward Movement of Some Plains Traits," *American Anthropologist*, 52 (April-June, 1950), pp. 174–180.

[40] See, for good examples, Stuart Rice, *Quantitative Methods in Politics*, New York: Knopf, 1928, pp. 154–155; A. T. and G. M. Culwick, "Culture Contact on the Fringe of Civilization," *Africa*, 8 (April, 1935), pp. 163–170; and, more recently, Charles J. Erasmus,

of key agents in the transmission of change.[41] More recent anthropological studies of acculturation of technical assistance campaigns have given close attention to the character of the contacts between donor and recipient societies, a subject to which we shall return in the section on social structure below.

An interesting new development in decision-making research has been the attempt, by several rural sociologists, to explore the psychological stages of the decision-making process and then to discover which media function most effectively within each stage.[42] For example, for the initial "awareness" stage of receiving information, the mass media are obviously more efficient than interpersonal relations, but the reverse is true for the stage of "acceptance." The importance of this work is that it makes even more salient one of the central themes of this decision-making tradition, which is that the channels are better viewed as complementary rather than competitive. In other words, it has become clear to many of those who have studied the role of the media in the making of decisions that different media are appropriate for different tasks and, consequently, that there is little worth to the gross question, which medium is more effective?

These studies begin to be more interesting when they are carried out within a larger framework of structural and cultural factors. Ryan and Gross, for example, used the decision-making approach to confirm the hypothesis which they found implicit in the logistic growth curve obtained for the spread of hybrid corn: that early adopters influenced the acceptance of the new seed by later adopters.[43]

"Agricultural Changes in Haiti: Patterns of Resistance and Acceptance," *Human Organization*, 2 (Winter, 1952), pp. 20–26. Some of these studies, it should be noted, are concerned rather more with channels of *distribution* than with channels of communication.

[41] Paul Radin, *op. cit.*, pp. 1–22. More recent examples include Richard N. Adams, "Personnel in Culture Change," *Social Forces*, 30 (December, 1951), pp. 185–189; Homer G. Barnett, "Personal Conflicts and Social Change," *Social Forces*, 20 (December, 1941), pp. 160–171; Wesley L. Bliss, "In the Wake of the Wheel," in Spicer (ed.), *Human Problems in Technological Change*, pp. 23–32; Henry F. Dobyns, "Experiment in Conservation," in Spicer, *ibid.*, pp. 209–223; Allan R. Holmberg, "The Wells That Failed," in Spicer, *ibid.*, pp. 113–123; Bertram Hutchinson, "Some Social Consequences of Nineteenth Century Missionary Activity Among the South African Bantis," *Africa*, 27 (April, 1957), pp. 160–175; I. Schapera, "Cultural Changes in Tribal Life," in Schapera (ed.), *The Bantu-Speaking Tribes of South Africa*, London: Routledge and Sons, Ltd., 1937; Omer Stewart, *Washo-Northern Paiute Peyotism: A Study in Acculturation*, Berkeley: University of California Press, 1944; Fred Voget, "Individual Motivation in the Diffusion of the Wind River Shoshone Sundance to the Crow Indians," *American Anthropologist*, 50 (October-December, 1948), pp. 634–646; Fred Voget, "A Shoshone Innovator," *American Anthropologist*, 52 (January-March, 1950), pp. 52–63.

[42] See James H. Copp, Maurice L. Sill and Emory J. Brown, "The Function of Information Sources in the Farm Practice Adoption Process," *Rural Sociology*, 23 (June, 1958), pp. 146–157; and Everett M. Rogers and George M. Beal, "The Importance of Personal Influence in the Adoption of Technical Changes," *Social Forces*, 36 (May, 1957), pp. 329–334.

[43] Ryan and Gross, *op. cit.*

What should be clear by now, however, is that the place of many of these channel studies needs to be reconceptualized. To the extent that they focus on interpersonal channels—that is, on the "relay" functions of interpersonal networks—they are concerned with social structure. And, if the sequence of events is taken into account whereby some persons are influenced by the mass media and others influenced by other persons, we have the beginnings of a diffusion study.

Ideally, a diffusion study should classify individuals according to their place in a social structure—that is, according to their relationships with other people. What we need to know is when this kind of differential placement in the social structure is also related to differential access to, or acceptance of, influence stemming from outside the group regardless of whether the channel of influence is television or a troubadour or a traveling salesman. Then, we want to know whether differential placement in relationship to others has something to do with passing on, or reinforcing, information concerning the innovation. Thus studies of "who influences whom" fall into place both as structural studies and channel studies. Their content ranges from the role of a prestigeful person in introducing the sundance to the Crow Indians [44] to the influential role of women with large families in the realm of marketing.[45]

In short, what is needed is a wedding of studies of the channels of decision-making and the social-structural approach to the study of diffusion so that influence and innovation can be traced as to how they make their way into a social structure from "outside" and as they diffuse through the networks of communication "inside."

6. SOCIAL STRUCTURE.   From the point of view of diffusion research, then, the social structure functions in several different ways. First of all, it constitutes a set of boundaries within which items diffuse. Secondly, as has already been demonstrated, the social structure describes the major channels of person-to-person communication through which diffusion flows. Additionally, social structure has to do with the distribution and differentiation of statuses and roles and the characteristic patterns of interaction among the occupants of varying positions. At least as far as diffusion is concerned, each of these functions may be seen to follow from the definition of social structure in terms of the frequency and the character of interpersonal contacts.

Consider boundaries, for example. Apart from making it possible to talk about the rate and extent of spread of an item within a system, boundaries are of interest to diffusion research because the frequency and character of social relations across a boundary differ from those within a boundary. Some studies have taken as problematic the determination of the effective boundaries within which diffusion takes place. For example, in his pioneering study of the diffusion of political influence, Stuart Rice discovered that state boundary lines acted as

[44] See Fred Voget, "Individual Motivation . . . ," op. cit.

[45] See Katz and Lazarsfeld, op. cit., Part III.

barriers to the diffusion of political influence except, interestingly, when residents of both sides of a state boundary shared a common marketing area.[46] A number of studies have dealt with the boundaries which arise in connection with systems of social and ethnic stratification. Acceptance of an innovation by a lower social stratum, for example, may block acceptance by higher strata and, by the same token, upper-status groups—as Gillin has shown—may actually try to block the diffusion of symbolically meaningful items to groups of lesser status.[47] The approach fits very well with classical sociological ideas about fashion changes in stratified societies.[48] The same kind of thinking is characteristic of studies which have treated intergroup cleavages and rivalries within societies as boundaries to diffusion.[49] Several studies have inquired into the strategies of boundary-maintenance: Freed, for example, has analyzed the ways in which the traditional Amish and Eastern-European Jewish communities managed to constitute social structures limiting incursions of influence from the world outside.[50] Finally, a number of anthropologists have confronted the problem of classifying the character of the social relations that exist across boundaries. Spicer, for example, tries to classify the variable relations between the Spanish conquerors and certain Indian tribes in terms of dimensions such as directed vs. non-directed, forced vs. permissive, hostile vs. friendly, and the like. From an analysis of these social interrelations, and the communications channels which they imply, have come various ideas about the kinds of items and changes which are likely to be associated with them.[51]

Curiously, more work has been done on the implications for diffusion of

[46] Stuart Rice, *op. cit.*

[47] See John Gillin, "Parallel Cultures and the Inhibition to Acculturation in a Guatemalan Community," *Social Forces*, 24 (October, 1945), pp. 1–14; on this same theme, see the theoretical discussion by George Devereux and Edwin Loeb, "Antagonistic Acculturation," *American Sociological Review*, 8 (April, 1943), pp. 133–147.

[48] See Georg Simmel, "Fashion," reprinted in *American Journal of Sociology*, 62 (May, 1957), pp. 541–558.

[49] For example, Homer Barnett, "Applied Anthropology in 1860," *Applied Anthropology*, 1 (April-June, 1942), pp. 19–32.

[50] Stanley A. Freed, "Suggested Type Societies in Acculturation Studies," *American Anthropologist*, 59 (February, 1957), pp. 55–68. Also see Joseph W. Eaton, "Controlled Acculturation: A Survival Technique of the Hutterites," *American Sociological Review*, 17 (June, 1952), pp. 333–340; and Eric Wolf, "Aspects of Group Relations in a Complex Society: Mexico," *American Anthropologist*, 58 (December, 1956), pp. 1065–1078.

[51] Thus, the combination of directed, permissive, friendly, intense and intimate contacts in the case of the Cahita led to the "fusion" of native and donor cultural elements while, in the case of the Athabascan, undirected, unforced, but hostile, intermittent and impersonal relations led to what Spicer calls "reorientation" or the adoption of a limited number of traits which, however, were extensively modified by the recipient culture. See Edward H. Spicer, "Spanish-Indian Acculturation in the Southwest," *op. cit.* For a related attempt to classify types of intergroup relations, see Edward P. Dozier, "Forced and Permissive Acculturation," *op. cit.*

the structure of social relations across boundaries than within boundaries. Certainly very few studies have been done on the basic problem of comparing the ways in which different kinds of structural arrangements within a group condition the diffusion of a given item. There are some notable exceptions, however. Larsen and Hill, for example, studied the differential patterns of spread of a message in a working class and in a college community, and also in summer-camp communities of varying degrees of stability.[52] Lionberger studied variations in the flow of information as between residents in matched neighborhoods and "non-neighborhoods," [53] and Stuart Dodd found that variations in social relations resulting from differences in city size and population density affect the rate and extent of diffusion of airborne leaflets.[54] Asking a different question about social-structural relations, Albert argues, on the basis of a comparison of the rate of acceptance of European influences in Ruanda and Urundi that, under certain conditions, innovation will diffuse more rapidly in more centrally organized societies.[55] Oscar Lewis has reported several cases of attempted assistance to under-developed communities where the social structure of these communities played a key role in the fate of the project. Based on his restudy of the Mexican village of Tepoztlán, Lewis describes an effort to introduce a modern medical service which encountered resistance from those sectors of the village that would now be called the power structure of the community.[56] In a second study Lewis describes the strategic significance of intro-community factions and cleavages for the eventual fate of innovations entering a village in India.[57] To the extent that a society is more complex, networks of social relations become increasingly specialized. Thus, in the study of the diffusion of new drugs among doctors, networks

[52] See Otto N. Larsen and Richard J. Hill, "Mass Media and Interpersonal Communication," *American Sociological Review*, 19 (August, 1954), pp. 426–433; and "Social Structure and Interpersonal Communication," *American Journal of Sociology*, 63 (March, 1958), pp. 497–505.

[53] Herbert F. Lionberger and Edward Hassinger, "Neighborhoods as a Factor in the Diffusion of Farm Information in a Northeast Missouri Farming Community," *Rural Sociology*, 19 (December, 1954), pp. 377–384.

[54] See Stuart Dodd, "Formulas for Testing Opinions," *Public Opinion Quarterly*, 22 (Winter, 1958–59), pp. 537–554.

[55] Ethel M. Albert, "Socio-Political Organization and Receptivity to Change: Some Differences between Ruanda and Urundi," *Southwestern Journal of Anthropology*, 16 (Spring, 1960), pp. 46–74.

[56] Oscar Lewis, "Medicine and Politics in a Mexican Village," in Benjamin Paul (ed.), *Health, Culture and Community, op. cit.*, pp. 403–434.

[57] Oscar Lewis, *Group Dynamics in a North-Indian Village, A Study of Factions*, New Delhi, India: Programme Evaluation Organization, Planning Commission, 1954. The importance of social cleavages and factions in relation to the adoption and use of new items is suggested by other studies as well, including A. R. Holmberg, "The Wells That Failed," in Edward Spicer (ed.), *Human Problems in Technological Change*, New York: Russell Sage Foundation, 1952, pp. 113–123; and also J. D. N. Versalius, "Social Factors in Asian Rural Development," *Pacific Affairs*, 30 (June, 1957), pp. 160–172.

of professional relations and networks of social relations were both found to carry influence, though at rather different rates and at rather different phases of the diffusion process.[58] A related point is made by Edmondson to the effect that the uniform rate of spread which he finds in his study of rates of culture-trait diffusion in the Neolithic may be a product of the essential similarity in the roles of all potential adopters; he speculates that the rise of specialists might change the picture substantially.[59]

More typical of current diffusion research is the use of social-structural factors to classify *individuals* rather than groups, both in terms of relative status and in terms of differential roles. A large number of rural studies take account of such factors as size-of-farm, age, education, membership in formal organizations and the like.[60] While it is true that, in general, these variables are related to the acceptance of innovation in predictable ways, there are occasional surprises. A number of studies have shown that older people are more likely to accept certain innovations (those that contain a "revivalistic" element, for example) [61] and, similarly, another study found persons of lesser education to be earlier acceptors of the Salk Vaccine under certain circumstances.[62] It is true that these standard variables do account for a considerable part of the variance in many studies, but they leave very many questions unanswered. And there are, of course, other structural variables which have been examined. Thus, Wilkening has studied the effect on innovation in farming of authoritarian vs. non-authoritarian family heads.[63] Larsen and Hill, and Lionberger, are concerned with the ways in which social status within a primary group makes people differentially accessible to others both inside and outside the group.[64] The study of the diffusion of a new drug among physicians focuses on the consequences of differential inte-

[58] Coleman, Katz and Menzel, *op. cit.*

[59] Edmondson, *op. cit.*

[60] For the influence of such variables on the acceptance of new farm practices see Lionberger, *Adoption of New Ideas and Practices, op. cit.*, Chaps. 8 and 9.

[61] See Fred Voget, "Individual Motivation . . . ," *op. cit.*, and the literature on nativistic movements generally.

[62] See John C. Belcher, "Acceptance of the Salk Polio Vaccine," *Rural Sociology*, 23 (June, 1958), pp. 158–170. Other studies of the diffusion of acceptance of the Salk Vaccine in other circumstances find the usual inverse relationship with education, social status, etc. Compare John A. Clausen, Morton A. Seidfeld and Leila C. Deasy, "Parent Attitudes toward Participation of Their Children in Polio Vaccine Trials," *American Journal of Public Health*, 44 (December, 1954), pp. 1526–1536.

[63] Eugene A. Wilkening, "Changes in Farm Technology as Related to Familism, Family Decision Making and Family Integration," *American Sociological Review*, 19 (February, 1954), pp. 29–37.

[64] Larsen and Hill, "Social Structure and Interpersonal Communication," *op. cit.*; Herbert F. Lionberger, "The Relation of Informal Social Groups to the Diffusion of Farm Information in a Northwest Missouri Farm Community," *Rural Sociology*, 19 (September, 1954), pp. 233–243.

gration in the medical community for time-of-adoption,[65] while a pioneering study in the field of marketing is concerned with the influence of a composite variable called "mobility" on time-of-adoption of new consumer goods.[66]

By the same token, group members have been studied in terms of the frequency and character of their contacts *outside* the group. Rural-sociological studies have taken accounts of such things as trips to the city, visiting outside the region, and personal contacts with agents of change such as salesmen, county agents and others who come into the community from the "outside world." [67] Certain anthropologically oriented studies of technological change in developing areas have taken similar account of contacts outside the community as a factor making for individual differences in the acceptance of innovation.[68] This kind of thinking, of course, leads directly to questions concerning the applicability of the hypothesis of the "two-step flow of communication" not only to mass communications but to interpersonal diffusion as well: Does influence tend to flow from individuals with relatively more contact with the "outside world" (not only the mass media) to those who stay "at home?"

7. VALUE SYSTEMS.   Social structures function, too, as anchorages for shared attitudes and values or, in other words, for culture. By the same token, roles are anchorages for certain individual differences in outlook and personality, though roles are not the only factor associated with personality. Attitudes, values and personality represent one of the major sets of variables that have been related to the acceptance of innovation and, if we consider them both at the level of the individual and of the group, it becomes possible to point out some interesting parallels between ostensibly unrelated traditions of research.

The central idea is that of "compatability" or "fit" between the culture of a group or the personality of the individual and the elements of a proposed innovation. On the group level, there are a number of anthropological studies underlining this principle.[69] Among early studies, Lowie's, Wissler's, Radin's and

[65] Coleman, Katz and Menzel, *op. cit.*

[66] See *The Tastemakers, op. cit.*

[67] For example, Ryan and Gross, *op. cit.*: F. E. Emery and O. A. Oeser, *"Information, Decision and Action*, Melbourne: Melbourne University Press, 1958.

[68] For example, Rose K. Goldsen and Max Ralis, *Factors Related to the Acceptance of Innovations in Bang Chan, Thailand*, Ithaca: Cornell Thailand Project, Interim Reports Series, No. 3, 1957.

[69] For a general discussion, and many specific examples, see Homer G. Barnett, *Innovation*, New York: McGraw-Hill, 1953. This general conception has long been a fundamental postulate of anthropological thinking about cultural change. See, for example, in addition to the references cited in footnote 2, Boas' thinking in an early paper (1911) later reprinted in *Race, Language and Culture*, New York: Macmillan, 1940, p. 299. Somewhat later Linton ably stated the important elements of earlier anthropological thinking on this problem in *The Study of Man*, New York: Appleton Century Co., 1936. It should be noted that virtually from the beginning this conception of cultural compatibility has been applied to two distinctly different aspects of change phenomena. On the one hand, the compatibility conception has

Spier's studies on various aspects of diffusion among American Indians all em-
phasize the role of culture in making for selective borrowing.[70] Somewhat later,
Elsie Clews Parsons also stressed that traits were taken over by Mexican Indian
townspeople from the Spanish and from others when they could "be fitted into
an old form of behavior and (were) compatible with existing emotional atti-
tudes." [71] Since these early studies, anthropologically oriented research on diffu-
sion has typically taken account of this principle. Furthermore, resistance to pro-
posed innovations as well as acceptance has often been explained in terms of this
conception; in such cases, of course, the emphasis is upon the incompatibility
between the receiving culture and the innovation.[72]

But all too few of these studies are comparative in the sense of setting out to
demonstrate that a given item is acceptable to relatively comparable groups
which, however, differ in values. One such example may be found in Oliver's
study of the greater acceptability of new plant foods in a community many of
whose rituals centered on the pig as compared with a community where *taro*, a
plant, was a center of ritual and an important element in many institutional
relations.[73] Hawley reports on a similar comparative situation where Catholicism
found greater acceptance among the patrilineally oriented Eastern Pueblo but
was incompatible with the matrilineally oriented Western Pueblo.[74] In much the
same way, Saxon Graham seeks to explain the differential penetration of television

been applied to the problem of what might be called "symbolic" or "meaningful" fit between
an innovation and the "mentality" of human targets of change; or perhaps more accurately,
the compatibility between the meanings and symbolic significance of the innovation as per-
ceived by the actors in question and their own system of values, attitudes and moods. On the
other, the notion of compatibility has been applied to what might be referred to as "func-
tional fit," i.e., the problem of the compatibility between the innovation and the adopting
system viewed from the standpoint of the *consequences* of accepting and using the innovation.

[70] Cf. footnote 2, above.

[71] See Elsie Clews Parsons, *Mitla, Town of the Souls*, Chicago: University of Chicago
Press, 1936, p. 536.

[72] For example, Charles J. Erasmus, *op. cit.*, describes a situation among Haitian
farmers, especially the backward ones, where the strong acceptance of a norm opposing "too
much" material success acts to block and/or delay the diffusion of improved agricultural
methods. Others who have emphasized this point include Charles P. Loomis and Glen
Gresham, "The New Mexican Experiment in Village Rehabilitation," *Applied Anthropology*,
2 (June, 1943), pp. 13–37; F. L. Bailey, "Suggested Techniques for Inducing Navaho Women
to Accept Hospitalization During Childbirth," *American Journal of Public Health*, 38 (Octo-
ber, 1948), pp. 1418–1423; Morris E. Opler and Rudra Dott Singh, "Economic, Political and
Social Change in a Village of North Central India." *Human Organization*, 11 (Summer, 1952),
pp. 5–12; Bertram Hutchinson, "Some Social Consequences of Nineteenth Century Mis-
sionary Activity among the South African Bantu," *Africa*, 27 (April, 1957), pp. 160–175.

[73] Douglas L. Oliver, "A Case of a Change in Food Habits in Bougainville, British
Solomon Islands," *Applied Anthropology*, 1 (January–March, 1942), pp. 34–46.

[74] Florence Hawley, "The Role of Pueblo Social Organization in the Dissemination of
Catholicism," *American Anthropologist*, 48 (1946), pp. 407–415.

and other leisure-time innovations in the middle and working classes in terms of the hospitality offered by the different sets of values of the two classes.[75]

On the individual level, the notion of compatibility, or fit, is equally applicable. Here can be located the whole tradition of motivation research in marketing. For motivation research is, in essence, the exploration of the symbolic meaning attributed by consumers to given items, seeking, ultimately, to tailor the item or its image to the consumer's personality.[76] Studying the introduction of television in England, Himmelweit established that even when class membership is held constant, different value orientations characterize early and late adopters.[77] The former seemed more present-oriented while the latter were more future-oriented and perhaps inner-directed. In addition, rural sociologists have occasionally dealt with the problem of the functional compatibility of a new practice in relation to the personality characteristics of the individual.[78]

In any case, this classification brings very different research traditions into touch. Nevertheless, although the long-run aim may be the same, the dependent variables tend to be different. Hawley and Graham, for example, are concerned with the comparative extent of penetration of the item being studied in groups with different values. On the individual level, Himmelweit is concerned with the acceptance of TV by a given date. Motivation researchers, however, hardly ever study actual acceptance; their dependent variable is more likely to be "propensity to accept" and even that is often vaguely defined. Indeed, it may be said that this entire line of work requires that a distinction be made between the potential adopter's perception of the compatibility of an item and some objective evaluation of its compatibility, particularly over a longer period. This distinction parallels, to some extent, the earlier allusions to the difference between first use of an item and continued use. The item may be perceived as attractive to begin with, but experience with the item may involve unanticipated consequences which prove the longer-run incompatibility. Thus, the ease with which Puerto Rican women were willing to begin use of contraception does not jibe with the difficulties of of inducing them to continue regular use.[79] In turn, this raises a more general

[75] Saxon Graham, "Class and Conservatism in the Adoption of Innovations," *Human Relations*, 9, 1 (1956), pp. 91–100.

[76] See George H. Smith, *Motivation Research in Advertising and Marketing* (New York: McGraw-Hill, 1953). An excellent example of work in this tradition is the early study of Maison Haire, "Projective Techniques in Marketing Research," *Journal of Marketing*, 14 (April, 1950), pp. 649–656, demonstrating that the initial resistance to instant coffee was based on an image that the product symbolized housewifely laziness.

[77] Hilde Himmelweit, *et al.*, *Television and the Child*, London: Oxford University Press, 1958.

[78] For example, Irving A. Spaulding, "Farm Operator Time-Space Orientations and the Adoption of Recommended Farming Practices," Rhode Island Agricultural Experiment Station Bulletin, No. 330, 1955; Everett M. Rogers, "Personality Correlates of the Adoption of Technical Practices," *Rural Sociology*, 22 (September, 1957), pp. 267–268.

[79] See Hill, Stycos and Back, *op. cit.* Also see Apodaca, "Corn and Custom," in Spicer (ed.), *op. cit.*

question concerning the tendency to overlook the fact that most innovative items consist of complex elements some of which may "fit" while others may not.

Apart from the notion of functional fit, however, there are other subheadings within the cultural dimension which must be accounted for. Thus, there is a set of ideas, both on the group and on the individual level, which would seem to have more to do with a *general orientation toward innovation* than with the specific compatibility between certain innovations and certain values. Rural sociologists have conducted several studies of variations in ethnic attitudes toward innovation.[80] On the individual level, too, early vs. late adopters, or adopters vs. non-adopters, have been studied in terms of orientations such as sacred-secular, scientific-traditional, cosmopolitan-local and the like.[81]

CONCLUSIONS

We have tried (1) to present an overview of the basic elements of the process of diffusion, and (2) to indicate, with respect to this accounting scheme, where each of a variety of research traditions has contributed as well as where it has fallen short, and (3) to specify problems which deserve further study.[82] We have drawn specifically on the early work on diffusion in anthropology, sociology and education, and on more contemporary work stemming from the sociology of mass communication, rural sociology, studies of acculturation and of technical change, public health and marketing. We have hardly begun to explore the work in folklore, geography, archeology, and other fields.

From the point of view of further development of the basic components, we have suggested (1) that the dependent variable, which we have been calling *acceptance*, must be more clearly defined; (2) that considerable ingenuity is needed to date the acceptance of innovations by their adopters, for *time* is the

[80] For example, Harold A. Pederson, "Cultural Differences in the Acceptance of Recommended Farm Practices," *Rural Sociology*, 16 (March, 1951), pp. 37–49; C. R. Hoffer, "Acceptance of Improved Farm Practices among Farmers of Dutch Descent," Michigan State College Agricultural Experiment Station, Special Bulletin No. 316, June, 1942.

[81] For example, Emery and Oeser, *op. cit.*; Ryan and Gross, *op. cit.*

[82] It deserves to be noted that, in 1952, a subcommittee of the Rural Sociological Society proposed a classification system for diffusion studies which resembles this one in part. It divided studies into those emphasizing (1) differential acceptance of farm practices as a function of status, role and motivation; (2) differential acceptance as a function of socio-cultural systems; (3) diffusion as the study of cultural change; and (4) diffusion as a problem of the communication of information. The present paper differs, first of all, in that it advocates the integration of these several approaches in each study, though it also views the elements of the diffusion process as headings in terms of which to organize the various traditions of diffusion research. Secondly, as far as the specific classification schema is concerned, our inclination is to view categories one and two as parallel; accordingly we have grouped the individual (category one) and group (category two) factors together, dividing them only according to whether they are cultural or structural in emphasis.

key to diffusion research; (3) that considerable effort must be invested in the development of a "content analytic" scheme for classifying *the item* which is diffusing; (4) that attention must be given to the *unit of adoption* "required" by an item in the light of the unit which is "prescribed" or the unit which is the "target" of a communication campaign; (5) that interpersonal *channels* of communication must be viewed as elements of social structure; (6) that work is urgently needed on the comparative study of the same item diffusing in different *social structures* and, finally, (7) that the notion of "compatibility" between a given *culture* or personality and an item must be formulated much more strictly.

From the point of view of the various traditions, we have tried to suggest how the work of each tradition contributes to a generic design for diffusion research. Thus, anthropology brings into clear focus the group as the unit of adoption, and intergroup, rather than intragroup, contacts; it devotes considerable attention to the structure of social relations between donor and recipient as central to an understanding of the fate of an item moving from one group to the other; it raises the question of "levels" of acceptance. Another contribution of the work in anthropology centers around the concept of compatibility—that is, the extent to which a given culture is receptive to a given new item. But almost no attention is given to channels, and little information is available about the progress of an item over time.

Early sociological work on diffusion also focused on corporate units of adoption (the municipality) as did educational research (the school system). In both these traditions, measures of time-of-adoption were explicitly formulated. Geographical proximity and urban-rural relations are the typical social structures in which channels of communication are thought, in some mysterious way, to inhere.

More recent work in mass communication, rural sociology, public health and marketing has focused explicitly on the individual as the unit of adoption and on his perception of the channels of communication which influence his decision to adopt. Rural sociology has continually taken account of interpersonal relations as a channel but this has not been true of mass communication or marketing research until recently. In each of these fields, there appears to be a growing interest in exploring the social structures in which adopting units are linked, and to introduce time as a variable. If it becomes possible to combine this approach satsfactorily and still take account of the ways in which other channels of communication, including the mass media, impinge on these structures the problem of designing diffusion research for modern society will be well on its way to solution. But there are no easy answers so far.

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