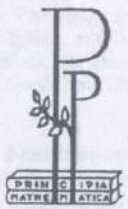
Psychological Linguistics

J. R. Kantor



The Principia Press
Chicago, Illinois
1977

ISBN 0911188-53-3

IN MEMORIAM

Edward Sapir

1884–1939

EMINENT SCHOLAR
NOBLE MAN

Contents

Preface

In this book I undertake a critical analysis of the psychological aspects of linguistics. Psychological linguistics constitutes a special department of the vast general linguistic field, though with unique data of its own. Accordingly, it must be clearly marked off from its interrelated disciplines. Psychological linguistics focuses upon the psychological acts or adjustments of organisms as they adapt themselves to their congeners, along with the things which they encounter, either directly by means of vocal utterances and gestures, or indirectly by means of writing and symbolizing behavior. In general, psychological language data differ from the descriptive and historical aspects of language which are concerned primarily with textual studies or other recorded objects. Note, however, that the psychologist is not indifferent to the facts of historical and comparative linguistics, the taxonomy of speech types, or the evolution and changes of language systems. Though the psychologist stresses ongoing language behavior, he keeps alert to the interdisciplinary problems arising from the fact that language-things are certainly more or less remotely derived from the communicative or referential behavior of organisms.

Psychological language adjustments comprise a large variety of unique activities within particular types of situations. These adjustments are performed vocally, manually, by all sorts of gestures, writing, the making of signs and symbols, and so on.[1] However, all these various acts are clearly distinguished from language things like texts, inscriptions, signals, graffiti, verbal records, social customs, and so on, even though the latter are products of or derivatives from authentic psychological behavior.

Although psychological linguistics is clearly different from conventional, general, or philological linguistics, it is still closely related to its since the latter is concerned with behavior products, in the

[1] Included in this list are the communicative behaviors involving the drum talk and the whistling talk of various communities.

first place as transcriptions of speech and symbolization, and beyond that codified and reified inscriptions like the graven stones and inscribed bricks of ancient oriental buildings.

Since this volume is primarily concerned with special types of psychological behavior it is of the greatest importance to specify the psychological postulates upon which this book is based. Unlike many works on the psychology of language this volume is built strictly upon scientific foundations. As I have been urging for longer than a half century, every statement of psychological fact and principle must be derived from observed activities of human and other types of organisms. In a series of publications [2] I have been proposing that students of psychological linguistics must depart radically from all types of the traditional mind-body heritage which still prevails even in a culture rich with great scientific achievements. By contrast, scientific psychology postulates that all psychological events consist of interactions of organisms with stimulus objects which evolve during the lifetime of individuals as they proceed on the biological curve from a point near birth and which ends at death. The behavior performed and observed constitutes adjustments or interactions to ambient things and conditions.

Scientific psychology, I have been suggesting, is exclusively concerned with segments of behavior or behavior fields consisting of organisms' interactions with other organisms or objects under definite conditions called their settings or auspices. For example, speech behavior fields essentially comprise three primary factors: (1) acts of speaker; (2) acts of a hearer; and (3) a referent, that is, an object, person, or event referred to. But of course, such behavior does not occur in a vacuum. Speaking as every other type of action, is a matter of time, place, and special occasion. It is set in a framework of other behavior, and of nonbehavioral accidents and conditions. The numerous diagrams throughout this work indicate the various factors of referential language or speech, as well as of nonreferential events.

[2] An Analysis of Language Data, *Psychological Review*, 1922, 29, 267–309. Can Psychology Contribute to Linguistics? *Monist*, 1928, 38, 630–648. Language as Behavior and as Symbolism, *Journal of Philosophy*, 1929, 26, 150–159. The Role of Language in Logic and Science, *Journal of Philosophy*, 1938, 35, 449–463. *An Objective Psychology of Grammar*, Indiana U. Publications, Science Series, 1936, republished by The Principia Press, 1952. Psychological Linguistics, *Mexican Journal of Behavior Analysis*, 1975, 1, 259–268.

To investigate the psychological aspects of language, however, it is not enough simply to operate within a scientific framework and to avoid commerce with extraspatial entities. In addition, linguistic behavior must always be treated as specialized types of psychological adjustments. It cannot be limited to human conventional verbovocal utterances, since many language adjustments can be and are performed in several other ways. Moreover, psychological linguistics includes the communicative and indicative or symbolic actions of other than human organisms.

The adjustmental viewpoint stands completely at variance with the view that speech or symbolic behavior can be exclusively characterized as actions originating through reflexological conditioning or performed only by the mediation of other persons. Instead of building upon a foundation of favored abstractions, the adjustmental behavior viewpoint is irrevocably tied to the boundless sweep of the actual interbehavior of organisms.

In this connection it is not inappropriate to quote the words of an eminent linguist who, although he did not share my objective psychological views, wrote as follows:

> A notable contribution to the understanding of language as a particular type of behavior is J. R. Kantor's paper on An Analysis of Psychological Language Data,[3] in which the peculiar characteristics of speech, whether communicative or expressive, are sought in its indirect nature as a response, the "adaptive stimulus" being responded to not directly but in the form of a reference, while a secondary stimulus, generally the person spoken to, is substitutively reacted to.[4]

This volume constitutes the culmination of an interest in speech and symbols which dates from as early as 1917. At that time I was interested in indicating the functional and evaluative nature of the categories constructed by the thinkers of the scientific and philosophical traditions. As the reader will see from the footnote on page xiv of this Preface, I have pursued linguistic studies from time to time since the first study mentioned until I organized the present project.

And now it is my pleasure to nominate several persons who have contributed to the making of the present book. I greatly ap-

[3] Published in the Psychological Review, 1922, 29, 267–309.
[4] Sapir, E., Philology, *Encyclopaedia Britannica*, 13th Edition, 1926.

preciate the typographic planning of Mr. Greer Allen. Thanks are due also to Mr. C. H. Joslin whose goal it was to produce informing and attractive illustrations. To Mrs. Maryo Ewell I am greatly indebted for highly competent and cheerful labors throughout all the procedures—typescript preparation, index-making, and so on—of book production.

November 1976 J. R. K.

Section One

SALIENT PROBLEMS OF PSYCHOLOGICAL LINGUISTICS

Chapter I

The Multiplexity of Linguistics

THE ISOLATION OF PSYCHOLOGICAL LANGUAGE EVENTS

Since my aim in this volume is to investigate the psychological aspects of language, my first operation is to isolate unique data as our primary object of study. Thus, it is imperative that we separate off our specific domain of interest from other things and events conventionally categorized as language. This specification of data so necessary in every scientific enterprise is especially important in linguistics, since because of the ubiquity and multiplicity of linguistic things and events, as well as the great variety in their mode of occurrence and resulting product, this domain is replete with uncertainty and confusion. Contributing to this unsatisfactory situation is the fact that, in the field of linguistics, there is an interpenetration of everyday references and technical descriptions concerning things and events with the result that obviously key terms like "language," "speech," and "linguistics," are indifferently used in the vocabularies of everyday intercommunications, as well as in standard scientific description. In consequence it is most essential to differentiate between the various types of language phenomena, in preparation for the later description and interpretation of authentic psychological language.

CRITERIA FOR ISOLATING DATA OF PSYCHOLOGICAL LINGUISTICS

To achieve the effective isolation of the data of psychological language, I set up several questions to suggest the essential selective criteria.

(1) Are the data at hand linguistic?

Many sorts of things and events have conventionally been counted as linguistic. The justification for employing a traditional category is that it can serve as a basis for comparing and contrasting,

or at least distinguishing variations in structure and function of the specific behavior covered by the "linguistic" blanket.

(2) Are the data psychological?

Only actual psychological adjustments of persons or organisms are accepted as psychologically linguistic. What is scientifically psychological, we shall discuss as we proceed. At this point we need only say that psychological linguistics may be either referential, symbolic, or gestural, in other words behavioral adjustments, but the gate is closed against language things however closely related to language behavior.

(3) Are the data psychologically intrinsic or extrinsic?

Assuming, then, that the authentic data of psychological linguistics consist of behavior that satisfies scientific psychology, we should determine whether they are central language adjustments, or whether they merely participate in or just support psychological language events.

SCHEMA FOR DIFFERENTIATING LINGUISTIC THINGS AND EVENTS

A. ADJUSTMENTAL FIELDS

I. Authentic Psychological Language
(a) Referential Language
Speech and Hearing
Verbal and Nonverbal Behavior
Writing and Signalling
(b) Surrogational or Derivative Language
(c) Gestural Language

II. Parapsychological Language Fields
(a) Verbal Formulae as Linguistic Products
(b) Speech Derivatives
(c) Potential Stimuli for Language

B. THINGS IN CONTEXT

III. Nonpsychological Language: Thing Language
(a) Signs and Signals
(b) Textual Materials, Records, Literature

(c) Inscriptions, Undeciphered Scripts
(d) Linguistic Systems: Dialectal, Communal, Cultural
(e) Standard Speech
(f) Constructs or Speech Descriptions
(g) Spoken or Written Formal Lectures

TENTATIVE IDENTIFICATION OF LINGUISTIC THINGS AND EVENTS

I. AUTHENTIC PSYCHOLOGICAL LANGUAGE

(a) Referential Language

In the science concerned with the behavior of organisms in interaction with other organisms and innumerable things and conditions of their environs, referential behavior adjustments serve as a clear-cut criterion for setting off psychological linguistic activities from all sorts of language data that are not adjustments of organisms, even though they may have been once related to the linguistic interactions of persons. Moreover, referential behavior can aid us to identify and classify the various types of psychological language.

Authentic psychological data prominently include referential performances of interpersonal communications as exemplified by vivid conversation, although other sorts of behavior such as vocal and nonvocal gesturing, writing, and communication by means of flags or light signals, are likewise included. Authentic psychological language actually covers a broad range of action fields. At one point are the lively interpersonal activities of conversational dialogue while at the other are the acts requiring the manipulation of tools such as pens or pencils, and even sticks for making marks in the dust or sand.

(b) Surrogational Language

The blanket term "language" covers various types of psychological acts though they differ greatly from the referential type of adjustments. Symbolizing behaviors may properly be called a subclass of psychological language behavior. They are best described as acts of relating or coupling signs or marks in surrogational as-

sociation with other signs or with things. Despite the long and vigorous tradition that "language is a system of signs, different from the things signified, but able to suggest them," [1] the production and use of signs or symbols, or their decipherment is a very different kind of behavior from basic referential behavior. Coupling behavior consists of acts of coding or indexing the first item of a couple with a second one. The decoding acts are those of a later time, or acts performed by another person.

(c) Gestural Language

From the standpoint of linguistic behavior, the gestures accompanying verbovocal behavior or independently performed verbal, manual, and general stances and movements of the communicating organism are just as important as vocal articulations.

II. PARAPSYCHOLOGICAL LANGUAGE

Under this rubric I place linguistic events that do not meet the criteria of authentic psychological language. They do not comprise the referential or bistimulational aspects of psychological fields. But they have traditionally been included in the linguistic domain by students of conventional linguistics. At best, however, they are related to psychological events, either as products or derivatives, or potential stimuli for authentic language behavior. We consider two classes of such linguistic items.

(a) Verbal Formulae

Because the most frequently performed referential behavior consists of verbovocal response systems [2] there is a tendency to include all vocal performances under the heading of language. This classification involves a structural criterion. Such action from the standpoint of communicative speech or symbology functions only as action things. The best examples are the verbovocal gestures or social greetings like "Good morning," "Hi," "So long," "Hello," and innumerable others. Such acts function as verbovocal motions or behavior for the production of sound things very different from the narrations of events, requests, demands, and the description of

[1] James, W. *Principles of Psychology*, New York: Holt, 1890, Vol. II, p. 356.
[2] Response systems are the units of psychological behavior; see Chap. IX.

things. Verbal behavior only classifies as speech because of the traditional notion that the tongue is the speech organ. There is a paradox here: all mouth action pertaining to sound is called linguistic, but at the same time imprinted material is also called language.

(b) Speech Derivatives

A distinctive subdomain of language consists of numerous things that have achieved linguistic denomination primarily because they are in some sense products or derivatives of speech or other forms of intercommunicative behavior. Some of the best examples are the numerous transcriptions or recordings of referential utterances. All the mechanical and electronic storage and retrieval of authentic speech by means of magnetic tapes, computers, and other forms of reproduction must be added here.

(c) Potential Stimuli for Language

In this category are placed various sorts of speech or writing related language objects that serve as potential stimuli for language behavior. However, until they serve as stimuli for language behavior, they are excluded from the behavioral aspects of speech or language.

III. NONPSYCHOLOGICAL OR THING LANGUAGE

Since we are confining our studies to psychological language, it is just as important to indicate what falls outside the scope of our work as to specify what belongs to our domain. One value of so doing is to admit that there is no absolute shutting out of our horizon the facts of necessary interdisciplinary connections between the different particular disciplines. The following paragraphs, it is believed, will suffice to mark off the various domains of study.

(a) Signs and Signals

Because language is treated as in some sense controllers of behavior, as stimuli to action, such objects as red and green lights, words as "Beware," "Curve," and also such signs as pointing arrows, are regarded as performing the same functions as authentic language behavior either verbovocal or symbolizing action, it is important to differentiate the two types of phenomena.

(b) Textual Materials

Employing the behavior criterion, I immediately exclude from psychological language all linguistic things such as written or printed texts whether or not they can be read, transcriptions or representations of authentic behavior, and of course, impressions on clay tablets, graffiti of various types, printed or written mottoes, as well as Islamic and other kinds of calligraphy.

(c) Inscriptions

Perhaps the most evident language things are the inscriptional objects existing as clay tablets, papyri, and stone stelae. Surely, they are all derived from psychological behavior, though not necessarily from any sort of speech performances. Even these objects like the linear A of the Phaestus disc or the Hammurabi stela which may have been constructed as proclamations and not simply records, are subject to the distinction between the action which produced them and the inorganic products of that action.

(d) Linguistic Systems

It is variously estimated that there are 3,000–4,000 distinct languages spoken by different groups of people over the world. Such estimates concern language systems such as French, Chinese, Bantu, English, Arabic, Swahili, and similar systems. Such entities are institutional things quite remote from specific language adjustments performed by individuals grouped or listed under the system names. To categorize such institutions as psychological is to involve oneself in the fallacies of group or social minds.

(e) Standard Speech

Unlike the general linguist, the psychological linguist cannot regard standard languages as anything but things. Such forms of speech are in effect artifactual models and pertain more to literary texts than to psychological action. Though it is true that the speech of some persons may be described as standard, most speech is dialectal or even idiolectal. Speech models are very far from authentic psychological language behavior, and therefore belong to the class of thing language.

(f) Constructs or Speech Descriptions

For the preliminary isolation of psychological language data and the scientific study of language, it is of the greatest importance to distinguish clearly between linguistic events and the constructs developed for describing and interpreting them. While it is generally easy to distinguish between verbal acts, and things referred to, in the case of language, words describing single words or clusters of words are frequently made identical with the verbal acts referred to. Nonpsychological linguists construct terms like "phonemes," "morphemes," "semantemes," among many others, which bear little or no relationship to the acts of producing and shaping sounds, gestures, and movements of speakers and hearers, or even to the products of their overt behavior. No doubt the manipulation of constructs rather than treating events results in the confusion of things and acts, and the inability to distinguish between the various forms and functions of speech behavior.

SEMANTIC PROBLEMS IN LANGUAGE STUDY

Terms used for the technical or scientific description of things and events should obviously be employed in an exact and significant way in order to facilitate investigation and report of results. Unfortunately, this is not always the case. Because language is metaphorical and fortuitous it is easy to trip upon "language's tangled skein." This is especially conspicuous among linguists. Linguistic writings reveal a reluctance to construct terms based on the observation of language things and events. Students of language prefer to employ arbitrary terms and fewer ones despite the multiplicity of linguistic things and events. An illustrative case is Gardiner's (1879–1963) assertion [3] that he is a pioneer in overtly making the English term "speech" stand for speaking acts, and "language" for everything else in the linguistic field, instead of indiscriminately equating the two. He supports his distinction by setting down the following sets of paired terms in other languages, and adds that only French has one term, "le langage," to embrace both "la langue" = language, and "la parole" = speech.

[3] Gardiner, A. H., *The Theory of Speech and Language*, Oxford: Clarendon Press, 1960, Second Edition, p. 107 ff.

	Language	Speech
Latin	lingua	Sermo
Greek	glossa	logos
French	langue	parole (or, discours)
German	Sprache	Rede
Dutch	taal	rede
Swedish	Sprak	tal
Arabic	lisan	kalam
Egyptian (old)	ro	mudet-speaking

Are two terms sufficient to differentiate the multitude of facts in the linguistic field or even to distinguish the most essential ones? Consider that the domain of linguistic studies comprises: (1) language capacity—"man is a talking animal," or "an aphasic has lost his ability to speak;" (2) language performance—"he spoke to me;" (3) objects of archaeological research—"no one understands the Minoan language;" (4) philological materials—"Bopp was one of the first to compare Indo-European languages;" (5) language styles—"Homeric Greek is a finer language than Attic Greek;" (6) language patterns—"Italian is a more musical language than German;" (7) literature—"The language of Shakespeare is unsurpassed;" (8) speech esthetics—"He speaks (writes) a beautiful language;" (9) symbol systems—"Mathematics is the language of science;" (10) instrumentality—"Latin is the most logical language."

All valid scientific description is more or less directly derived from observation of events. For this reason, perhaps, we can neither expect such description to be lifelessly fixed in reference nor complain when it is not so. But we can never be exonerated from explaining what we refer to, nor let our analyses or descriptions be inexact because our terms are incompressible into sheer symbolic objects. Distally, we are not merely interested in the correlation of descriptions and events described, but also in the nature of the events themselves. In distinguishing psychological from other types of linguistic events we may utilize either of two techniques. We may emphasize the differences between (1) linguistic interactions and linguistic things, or (2) indicate the relations between nonpsychological and psychological linguistic factors by analyzing out each

of them from the pool of linguistic events. In my *An Objective Psychology of Grammar*[4] I have pursued the former method. In the following chapters of this book I shall proceed to carry out the latter.

[4] Kantor, J. R., *An Objective Psychology of Grammar*, Bloomington: Indiana U. Science Series, 1936.

Chapter II

Linguistic Complex Analyzed: Components Compared

SPECIALIZATION IN LINGUISTICS

Consider a comparatively simple linguistic event, such as the utterance of a single word, "Look." In this event there are many phases or aspects of which the psychological is only one. In studying this event, every specializing linguistic student must firmly grasp the datum of his own particular domain.

Linguistics, as the general science of language, is therefore divided into many departments. Different students direct their investigational attacks upon the various aspects of the crude datum. In the case of oral-aural speech, the sounds uttered are analyzed by the physicist, while the physiologist is interested in the organs and their functions involved in sound production. The grammarian or general linguist is concerned with word and sentence structures and their meanings. The lexicologist approaches words from the standpoint of their origin, history, and usage. The symbologist, on the other hand, wishes to know whether any particular word has its own proper function, and whether it is properly performing it. Again, the physician and pathologist are concerned with abnormalities of speech and the conditions underlying them. These are some of the many types of inquiry in the general field of linguistics. Each linguist approaches language with a different investigational interest. What of the psychologist? He, as we have already made clear, studies language as behavior, as adjustments to other persons, things, and events, serving as stimuli. Thus our task is set. In the present chapter we compare the various aspects of language study and suggest the ties that bind them.

PSYCHOLOGICAL LINGUISTICS AND GENERAL LINGUISTICS

An outstanding comparison between the components of the linguistic complex concerns the role of sounds in linguistic behavior. General linguists treat language as mainly objects, whether

consisting of sounds or written or printed materials. Grammarians usually concern themselves with sounds making up words and sentences. Further, they classify sounds as vocal and consonant qualities, then pitch as differentiated from timbre. Every sound mass may be reduced to simpler sound elements, each of which may be correlated with a distinct wave of definite vibrational frequency. The psychological student of language questions whether it is necessary to produce as much sound as would represent every syllable in speech. Studies made by telephone engineers indicate that only a percentage of sound is actually necessary to converse over the telephone wire. From the psychological standpoint, sound plays a double role in linguistic situations. On one hand, sound is an all-important feature of vocal language, but only of minor importance otherwise. In interpersonal situations, of course, sound is an indispensable medium of stimulation. No auditory verbal speech can exist without sound as a means of bringing the speaking persons into contact. No matter what A says to B, the latter could not hear nor understand anything without the sound medium. We can no more hear what is said without sound waves than we can see without light. No matter how many objects are present, without light they are as if absent in visual situations. The same is true for auditory objects *sans* sound. In sum, sound is an essential factor in interpersonal intercommunication. Again, sounds in the form of words and phrases constitute the stimuli for speech reactions. We are now considering the audient or hearer, the person who is reacting to speech responses. The speaker stimulates him in part by means of specific sounds which constitute the auxiliary stimuli for the hearer.

Now to point out the slighter connection of sound and language. Cannot language go on without sound? This is certainly the case when only one person is involved. When we talk to ourselves the whole process can go on in the form of subvocal or nonvocal behavior. It is this kind of language which is so important as aids in silent reflection.

But even in auditory speech, whether homogenic or heterogenic,[1] sound phenomena may play a minor or even negative role.

[1] Homogenic signifies that the person interacts with himself, as in self-conversation, while heterogenic refers to ordinary interpersonal speech reaction. Cf. Kantor, J. R., *Principles of Psychology*, Bloomington: Indiana U. Press, 1924–6, Vol. II, Chap. on Interpersonal Reactions.

Speech constitutes actions—forms of adjustment so even heterogenic speech can go on without words, without sounds. Persons can adapt themselves linguistically by gesturing—in other words, by interacting primarily in a visual, or manual, way, since speaking is always the action of a total organism.

PSYCHOLOGICAL LINGUISTICS AND PHYSIOLOGICAL LANGUAGE

Action or behavior presupposes an acting organism. Hence an extremely intricate relationship exists between the psychological and physiological aspects of language. As the activities of organisms, psychological phenomena are always at the same time the functioning of biological structures. It may be best, accordingly, to consider the interactions of an organism with a stimulus as the larger aspect. The physiological aspect or the functioning of organic structures may be looked upon as participating in the larger adjustment.

An analogy clarifies this relationship. When we are interested in moving something from one place to another, then we may regard the structure of the vehicle and its operation as only participative factors in the transportational event. Similarly, when a linguistic response is a verbal action or a nonvocal gestural movement, anatomico-physiological participative elements can be isolated by an analysis of certain structures and their functions. In the verbal language reaction we observe the activities of the tongue, lips, larynx, and lungs. When the response is a gestural one, the arms, shoulders, etc., are the factors isolated. But in no case is it permissible to assume that the activity in question is exhausted in the work of the isolated organs. Since every linguistic act is the adjustment of the organism to a stimulus object or situation, the total organism, with all its anatomical and physiological features, participates in speech responses. We must not, therefore, be misled by philological traditions to look upon the organs of the head and throat as exclusively language organs.

PSYCHOLOGICAL LINGUISTICS AND SOCIOLOGICAL LANGUAGE

Sociology is the science of groups and societies. Naturally, then, a large part of this discipline is concerned with the activities and

relations of persons. Language as a sociological fact constitutes one of these communal forms of activity. Accordingly for the sociologist, as for the psychologist, language is behavior.

But there are great differences between these two notions of activity. For the sociologist, language is primarily a sort of behavior instrument—a kind of tool which serves to aid persons in carrying on the processes involved in living together. Thus sociological language operates as a means of domination and control. Such behavior is merely descriptive action—responses statistically organized.

Psychological language is another kind of behavior altogether. As the specific activity of individuals responding to things, it constitutes exceedingly particularized behavior. The contrast between sociological and psychological language marks the difference between intimate interpersonal adjustments and mass activity. This relationship is the reverse of that obtaining between the physiological and psychological phases. Psychological language is thus a particular aspect in sociolinguistic activity. Since language always occurs in societies, sociological language comprises the whole, of which psychological phenomena are the parts.

So much for sociological language when it is behavior. It is not, however, always activity, but may consist of things. And these can be related to psychological language only as possible stimuli for psychological reactions. For the sociologist, then, language is studied as a feature of a cultural inventory. The linguistic aspects of a society are regarded as cultural products. The sociologist describes the presence in a particular group of a certain type of language, just as he describes the social organization, religion, and customs of that group. This inventory draws no lines of distinction between behavior traits of a community and the objects which also constitute the civilizational equipment of one society as compared with another. Language, custom, and religion, fall in the same category as canoes, pottery, weapons, and the techniques and products of industrial art. Especially is this evident in the case of writings—in brief, records and literature.

Sociological thing-language may be regarded as the counterpart of psychological language. The language of a society obviously exists prior to the advent of some particular individual in the group. Thus, when an infant is born, what is summed up as the language of his group comprises potential stimuli which will eventuate in

language reactions that in their entirety will constitute his language. Included among such sociological language stimuli are written materials or literature, as well as the generalized speech of a community.

PSYCHOLOGICAL LINGUISTICS AND ANTHROPOLOGICAL LANGUAGE

As the science of man, anthropology is obviously concerned with human society and, of course, language. But, as compared with the sociologist who confines himself to particular existing societies, the anthropologist investigates the historical careers of divergent societies and resulting differences in their evolution. Anthropology therefore studies various phases of society comparatively.

With respect to language, the anthropologist's task is to study its origin—a two-sided program. First, he inquires into its primary origin as distinctively human activity. This is tied up, of course, with the evolution of man out of his progenitor species. With the aid of the paleontologist the anthropologist attempts to determine when animals began to speak—a problem bearing upon the anatomical and physiological career of the genus *homo*.

This question of origin is further concerned with the growth and changes in language resulting from man's civilizational evolution. This is the problem of the development and spread of conventional language. In sum, the anthropologist handles language as a general type of human behavior.

Again, anthropologists study the so-called primitive or natural societies. He asks whether the language, as well as any other object in a group, has originated in that particular community or has been borrowed from some other set of individuals. This carries him over to the problem of linguistic changes owing to modifications in the life circumstances of a society or the mixture of groups as the result of war or conquest.

Language as a form of social behavior likewise falls into the anthropologist's field of study. Obviously, language depends upon the vicissitudes of groups. When one asks what things are spoken of, one must turn to the type of society in which the language occurs. For example, the vocabulary of a tropical society does not

include words like "snow," "ice," "freezing," etc. Similarly, the language of arctic societies lacks such words as "palm," "orchid," and others referring to tropical objects. Again, some languages have no elements referring to large numbers, while others contain mostly words for specific qualities or particular things, but not for the species of things or general properties. These variations in language type are dependent upon the human circumstances in which the language is found. At the present time the Chinese, Japanese, and other groups are developing references to the scientific, technical, and other objects of the Western civilizations they are adopting.

Since the specific language reactions of persons to the stimulus objects of their surroundings mirror the general human adjustments of groups to their environments, linguistic phenomena fit into the larger domain of ethnological linguistics.

PSYCHOLOGICAL LINGUISTICS AND LEXICOLOGY

Lexicology is that branch of linguistics which investigates the existence and use of words in a language. The lexicologist is interested in the connection between certain words and that for which they stand. Words are traditionally looked upon as intermediaries between things and ideas—signs for the things mirrored in or projected from the "mind."

When lexicology is studied comparatively, the student extends his interest to the fact that "il cane," "der Hund," "le chien," "the dog," are variant signifiers of the animal significant—dog. The symbological linguist also inquires concerning the relation between complex signifiers, such as sentences and phrases and their significants. For instance, he may concern himself with the relation of such phrases as "The sun rises," "The sun sets," to the actual solar phenomena involved.

Lexicology has two distinct branches. The first is semantics, which stresses the meanings of words. The problem here is what words carry certain significances. Since semantics is a branch of philology, the actual data with which the lexicologist works are words. But the emphasis is on their meaning.

Another branch of lexicology is etymology. The etymologist is primarily concerned with the origin of words used to signify certain

things, and with the changes in the significance of sounds, words, or phrases. Emphasis is placed upon words whose histories indicate a successive series of usages.

Now psychologists may or may not be interested in lexicology. If we regard the dictionary as a record of the various methods by which persons react to different things, then lexicology certainly is of some concern to the psychologist. Each dictionary, constituting a record of human action, is, if not a description of behavior, a record of certain types of action. Such a record might mislead us to think that gestures would not answer as well as words. Nor would specific differences in the use of words, personal equation of meaning, differentiation of pronunciation, accent, stress, etc., be indicated in this record. As in the case of grammar, we have here merely a survey of conventions, a very incomplete, and as we have indicated, perhaps misleading, record.

On the other hand, if the words in the dictionary are regarded merely as symbols or signs standing for things, they have no connection whatsoever with psychological language. They are no more related to living speech than other objects presumed to stand for other things. The mere fact that the dictionary contains word-symbols or word-signs gives it no greater claim upon language than if it represented other sorts of objects.

PSYCHOLOGICAL LINGUISTICS AND PHONETICS

Making use of a biological analogy we may divide off phonetics, which studies the morphological character of words, from the correlated branch called semantics, which is interested in their functions or meanings.

The science of phonetics treats the sounds made in speaking as action-products or sound-things. These sound-things are assumed to be verbal tools or instruments for purposes of communication and in general to accomplish what cannot be done without the intermediation of vocalized phonetics.

Language sounds may be studied from the standpoints of both the speaker and hearer. As speech products, sounds constitute complexes made up of elements. This series (sentences) is made up of words, which in turn are divided into syllables that are further

subdivided into vowels, diphthongs, and consonants. Such analyses are often made upon the basis of the specific organs (lips, tongue, teeth, etc.) in the production of sounds.[2]

The hearer, while interacting with these speech products, comes into contact with them either directly as actual sound-things, or indirectly with their representatives—namely, transcribed symbols. Phonemes therefore are more definitely things from the hearer's than from the speaker's point of view.

Phonetics comprises two important types of investigation. The first is the study of the sound construction of an existing language. But since languages are constantly changing, it is just as important to study the transformations taking place in any given language. Thus linguists have worked out a number of formulae of sound changes, of which the various statements of sound shifts called Grimm's (1785–1863), Rask's (1787–1832), Verner's (1846–1896) and Grassman's (1809–1887) are notable examples.

For the most part phonetic materials are articulated stimulus objects for linguistic behavior. For example, an infant who is first building up language responses does so by interacting with the sounds of the nurse's language behavior as stimuli. These sound-objects operate as stimuli along with gestures of all sorts, and persist as linguistic stimuli throughout the individual's life.

Phonetic materials are not, however, limited to stimuli, but serve also as descriptive records of how people speak so far as vocalization patterns are concerned. But in this case we must not confine ourselves to the standard or ultraconventional sounds of a grammar book, but include also the specific articulations of particular individuals.

PSYCHOLOGICAL LINGUISTICS AND GRAMMAR

The interests of the psychologist and grammarian are supplementary. While the psychologist studies language as adaptations to stimulus objects, the grammarian is interested in the style of these adaptations. For the most part, the materials of grammar constitute the fashions and conventions that have become established. Since

[2] For an excellent example of the linguist's handling of sounds, see Bloomfield, L., *Language*, New York: Holt, 1933.

language comprises intimate features of particular societies, speakers more or less conform to their groups. It is the work of the grammarian to report what the linguistic conventions of specific groups are. And so while the Englishman says, "The gardener picks the flowers," a German says, "Der Gärtner pflügt die Blumen." In this way the grammarian and psychologist supplement each others' descriptions of speech activities.

As the study of speech conventions, grammar may be regarded as a specialized branch of the social sciences. The grammarian's interest in conventions may even go beyond mere vocal action to the description of the vivacity of speech and the specification of what certain societies taboo and outlaw in the way of linguistic behavior.

Notice, however, that the intimate relation between psychology and grammar extends only to the grammar of living language. Historical grammar is not concerned with actual speech, but merely with dead language forms. Quite different is language as psychological behavior.

SCIENTIFIC PSYCHOLOGY AND GRAMMAR

Because traditional grammar is based upon a crass mentalistic psychology derived from an early period of its career, it is quite unrelated to a scientific linguistic psychology. For the traditional psychologist language consists invariably of the translation of ideas into sounds, syllables, words, and sentences. A soldier kills a farmer. A tells B of the happening. Comes the grammarian and explains. First A has ideas in his mind representing the details of the event. Second, the ideas are expressed, or encoded, into verbal-motor action, represented by the words, "The soldier kills the farmer." In analyzing the statement or sentence the grammarian isolates a hierarchy of elements, of which the most superior elements are semantemes. Thus, "soldier," "farmer," "kill," are considered the essential features. All the other elements in the sentences, called morphemes, are presumed to indicate the relationship between the fundamental factors—that is, the semantemes. These morphemes, as the members of the hierarchy just below the semantemes, also are ordered. Pure relational morphemes are regarded as equally essential for the sentence. For example, the position of the semantemes is presumed to inform us that it is the soldier who kills the farmer. If the sentence order were reversed we would know that the farmer kills the soldier instead. The pure relational morpheme, then, contributes definite syntactic form to the sentence. The absence of an "s" at the end of soldier and its presence at the end of kills constitute concrete relational morphemes, such as the suffix "er," which are presumed to represent agencies.

Now quite aside from the unacceptable mentalistic psychology involved, it is obvious that we have here nothing but an analysis of sentences as they are spoken, or, better still, as they are recorded and established in grammar books. As such the language of philology is far removed from any sort of psychological behavior. This sort of study may be regarded as an analysis of things, precisely as the anatomist cuts up an organism into a number of parts.

Is this a fair statement? Certainly the question of fairness arises, because if the grammarian studies speech, he must treat it as a dynamic phenomenon. But such analyses as indicated above always presume fixity. And obviously language is not fixed. While grammatical materials are alleged to be records of what persons do when they speak, it turns out that this is not at all the case. Were this true, every language, in order to take account of dialectal and colloquial variations, would have to be described in innumerable grammars. Speech is no such standardized thing as can be confined in a single formulary. At most, grammars represent prescriptions—namely, what one should do when one speaks (or better, writes), rather than what one actually does. More charitably put, grammars stand for what the "best" writers do. In sum, grammatical language is hardly action of any sort, but rather emaciated skeletons. A wide canyon separates grammatical paradigms from linguistic adjustments.

To illustrate, German grammars indicate a perfectly definite set of forms to express the future, yet German speakers do not say "Ich werde kommen," even though foreigners who learn the language out of books may sometimes do so. Similarly, French grammars list the whole set of past definite forms, though these are not used in speech, but only in literature.

Examples may be multiplied *ad libitum*. The tendency of grammarians to look askance at interjections indicates a sharp division between the formal elements of crystallized words and actual

immediate linguistic behavior. For this reason the alert grammarian refuses to have anything to do with roots as original prototypes of language, since he realizes they are obviously the results of formal analyses. He also rejects the conventional stereotyped parts of speech.

When we consider comparative grammar, the division between the data of grammar and of psychology becomes still clearer. The comparative grammarian assumes that the speakers of all language groups have the same "ideas" in their "minds," but translate or code them into different verbal forms. Thus is instigated all the zeal with which linguistic students compare languages. In one language system things are classified in just two genders, while in other systems there are three or more. In some language systems women are categorized as neuter while in other languages this is not the custom. The comparative grammarian also reports that the speakers of one language system express their "ideas" of number exclusively in words that mean one or many, while those belonging to another linguistic class add a dual number.

All this, of course, is familiar ground, and it is not necessary to explore it further. Suffice it to say that even though the facts of comparative grammar are exceedingly interesting and important, they are remote from being psychological. In tracing out the differences in linguistic forms found in different linguistic groups, it is precisely the purpose of the philologist to stress established customs rather than intimate speech adjustments of speakers. Obviously there could be no science of comparative grammar if the attempt were made to corral individual linguistic acts. By comparison with conventional grammarians, psychologists are interested in momentary and variable responses. Moreover, psychological language involves much else than fixed verbovocal forms—for example, shoulder shrugging, hand movements, facial gesturing, and postures of organisms.

The psychologist therefore gives an entirely different description of the speaker's action from the grammarian's. In no sense does a speaker translate into motor-verbal acts the "ideas" of the "mind." What he does is to react verbally and gesturally to the objects or events to which he is adapting himself in specific situations. When he speaks of the soldier killing the farmer, he points

to the event, uses verbal references, gesticulates, and so on, depending upon the nature of the situation. The characteristics of the person's action are determined by the stimulating and environing conditions. If it is a soldier who kills the farmer, rather than some other person, naturally this difference is referred to in the individual's response. In the same way all the elements of the event —time, place, agent, actor, thing acted upon, are referred to in the speaker's activities. The psychologist also takes account of individual differences in speaking. Speaker A's responses may consist of cut and dried utterances or an admixture of slang. B's activity takes on an entirely different complexion. Much is therefore involved in the response which is of no interest or availability to the student of formal linguistics.

PSYCHOLOGICAL LINGUISTICS AND SEMIOTICS

Semiotics is an intellectual institution originally cultivated by ancient philosophers interested in epistemology or the nature of knowledge. In more recent times, semiotics is associated with such names as Locke (1632–1704), Peirce (1839–1914), Carnap (1891–1970), Morris (1901–), and many others. Fundamentally semiotics may be characterized as a discipline concerned with the interpretation of sign-objects including all things natural and artifactual, entire worlds, and universes, to which they are reduced.

Probably the most outstanding feature of semiotics as a discipline is its assimilation to the philosophical movement which is based on the premise that philosophy consists primarily of the criticism and improvement of language.[3] Indeed, semiotics is said to be the entire science of language.[4] The bond of semiotics and language is reputed to be the identity of semiotics with semantics—but without differentiating between speech, acts of coding and decoding, and things existing independently of persons and their actions.

At once we observe the great gulf that separates the "science of signs" from the linguistic sciences, both general linguistics and psychological linguistics. The subject matters of each are different as well as the purposes of the devotees of each type of investigation.

[3] See Chap. XXIV.

[4] Carnap, R., *Introduction to Semantics*, Cambridge: Harvard U. Press, 1942, p. 9.

Since there is so much confusion as to the nature of the various data and their interrelations it becomes our task to examine the various things and events comprised under the categories of signs, symbols, signals, referential or surrogational language. The primary criterion for differentiating the various data must, of course, be whether or no what is studied consists of psychological behavior or of objects that may or may not be stimulus objects for any sort of performance.

SIGNS AND BEHAVIOR

Writers on semiotics who begin with epistemological premises are quick to distinguish between signs as the elements or atoms of the universe, and their interpretation. They thus discern the important distinctions between signs as things existing as such, and things involved with acts of interpreters. This is certainly the beginning of wisdom with respect to signs. Some support they may derive from the fact that the signals which they include under signs tend toward some action to which the signal shows the way.

But what appears as a heinous intellectual offense is the reduction of everything to signs, even the various linguistic stimulations. For our part, at present, we merely condemn the senseless metaphysics and cosmology involved. What concerns us, especially now, is to unveil the fallacies of reducing language to signs through the magic process of reducing language to symbols and symbols to signs. We turn now to the examination of symbology.

SYMBOLS AS THINGS OR ACTIONS

Symbology as an independent discipline is the science of implied relations. The simplest of these relations is that obtaining between two things. One of these is called the signifier, and the other, the significant. The symbologist is interested in the conditions under which each of the members of a couple imply or stand for the other. Symbology might be regarded either as an independent or an applied science. As an independent study it deals with relations irrespective of the specific nature of the related members. When, on the other hand, symbologists are primarily concerned with the nature of related members, it is then a branch or aspect of some other science—for example, logic or mathematics.

Symbology as coupled to linguistics occurs on two levels. Superficially, symbols become of interest to the general linguist when utterances are fixed or represented by words. This is the basis for analyzing words into signs for things or meanings. On a more profound level, the complex phenomena of speaking and being spoken to are crystallized into descriptive symbols or things, such as sounds (phonemes), meanings (sememes), grammatical arrangements (taxemes), etc. It is in order now to examine the connections between linguistic behavior and verbal symbology.

It is invariably true that when linguistic phenomena are most symbolic they are farthest from being referential or even psychological. The best example of symbolizing language is represented by the relation of words and things. When words are taken to be symbols, it is assumed that the names of things or acts constitute the signifiers for those things or acts. As significants it is clear, then, that symbology applies best to language when words are regarded as objects or marks on paper.

ACTS AS SYMBOLS

But what if the words are acts? Actions may be symbols as well as things. Does this mean then that referential language or speech is a type of symbolism? Decidedly not. How little justification there is for calling linguistic reactions symbols may be gathered from the suggestion that even the simple stimulus and response phases of elementary interactions are not symbols one of the other. Certainly the hot object which stimulates someone to jerk his hand away is not a sign or symbol of something. Only by the most arbitrary conversion could the situation be so interpreted. Similarly, when a person by speaking to someone stimulates that person to act, there is no reason to regard his speech as a symbol. To do so means that we arbitrarily make words into signs.

TRIADIC SYMBOLOGY

Our inquiry does not stop here. Let us not limit our situation to two variables, but assume that our relation is triadic, including (1) the person who utters the words; (2) the words; and (3) the things to which they are reactions. When a person utters a word or sentence, may we regard the utterance as a symbol signifying the thing to which it is a response?

Speaking is surely not symbolizing. While it is possible to stand

beside a speaker and interpret his words as symbols standing for things, this does not mean that language is symbolic. No more so than the comet is a symbol of kneeling, although we might observe a person kneel whenever a comet swims into his ken. True, we may symbolize or interpret the comet as a sign of required worship. This is merely applying a name to a thing—to wit, calling it sign, signal, or symbol. But clearly the name represents no description of the thing. It does not expose its essential character. The comet, and by analogy the word, is only a symbol by someone's thinking or saying so.

SPEECH AS ADAPTATIONS

Speech behavior, we repeat, is performing reference adjustments as adaptations to situations. Now it is true that speaking involves a thing spoken of and a person spoken to. But does the fact that the speaker tells the hearer something about the thing spoken of make his speech into symbols for the thing? Surely there is neither an intentional nor unintentional symbolization.

Speaking, much more than symbolization, is intimately involved in adaptations to things. Language behavior constitutes performances integrated with situations and is in no sense representational. As a matter of fact, in certain situations even speaking behavior may not be intimately enough integrated with other involved events to operate as an adjustment. For instance, when an automobile is about to strike some person, he just springs out of the way; or when the latter happens to be a child, the acting individual merely pulls the child out of harm's way. Speaking is an alternative form of adjustment only when there is time and an understanding hearer, or listener. Psychological language is in no sense a series of counters standing for things or acts. To think of an intimate adjustment such as psychological language as a set of mere signifiers is to overlook the specificities of adjustmental events.

Even though every linguist may fall into the error of treating spoken words as symbols or signs, he knows full well they are not that sort of thing. Only metaphorically, then, is he correct in describing spoken words as things. Actually, word utterances are superlatively vivid performances, constantly becoming modified and changed, so that a particular word now constitutes a reaction

to one thing and then to another.[5] Spoken words are in no sense fixed elements bearing a direct and definite relation to a referred-to object. Words regarded as symbols are still farther removed from psychological adjustments than are the words or action patterns of the grammarian.

To convert speaking events into symbols results only in overlooking all the actual conditions of speech behavior. For instance, when a person speaks to himself, definite symbology is obviously unnecessary. Again, when speaking, a person is far from merely translating an object into a symbol or using a symbol which stands for an object, but rather he is casually, excitedly, or irritatedly responding to a situation. His response as far as words are concerned may be jargon.

One can, of course, speak symbolically. This is the case when one writes or signals. But in any event, the person is performing a distinct psychological adaptation and it is immaterial whether his action consists of speaking or writing words, making gestures, or setting up or waving a lantern. The conditions here are entirely different, however, when we think of the individual as merely setting up a sign which points to some thing or condition signified. In the latter case the sign or symbol, even if it be the most active performance, must be regarded as a fixed thing, a sheer member of a relation. The important adaptation from the standpoint of the symbologist is made by the person who takes the symbol in its proper relationship to the thing or condition symbolized.[6]

So far we have been considering the acts of the speaker. Let us turn now from the person who acts in order to stimulate some other individual, to the person who reacts to this stimulation. Is his linguistic hearing reaction a response to a symbol? By no means. There is a distinct difference between reacting linguistically and knowing what a symbol stands for. When A hears something spoken, does he not primarily react to the object instead of to a symbol of it?[7]

Clearly there is a confusion here between symbolism and un-

[5] See Chap. XI.

[6] Here, too, knowing or recognizing that the lantern or word stands for something is not language, but another sort of psychological performance.

[7] A's reaction, of course, may be called out by a thing which substitutes for the adjustment stimulus. But is a substitute stimulus a symbol? Cf. Chap. III, p. 43.

derstanding. This multiplies our errors by two. First, even if we do have meaning or understanding reactions, are these simply symbols operating? And even if understanding or knowing is symbolization, are they language? It is only when we take isolated words—namely, the dead fruits of speech, that we can regard them as signifiers or elements in a relational couple. But such words are no more psychological language than the objects in the road which one uses as a landmark. True enough, that object means something to that person. When he sees it, he knows that he must turn to the right. But would it be proper to say that it speaks to him or tells him where to go? Even though such an object is a stimulus for an understanding response, it is no essential feature of a linguistic event.

The words in a book or hieroglyphics on a monument may be regarded as symbols in this same sense. When X discovers what these words or signs stand for, it is no violation of metaphor to say that they excite and enlarge his understanding. They are his teachers. From them he learns all the glories and vicissitudes of a departed race of people—how they lived, worshipped, and spoke. Now even if these signs are the crystallized precipitates of what was once vivid adjustmental language, they are obviously not so any longer.

Again, X visits a foreign country. He hears a strange tongue spoken. He understands that the speaker is telling the other person something. If anything that stimulates him to understand is a symbol, we have here perfectly operating symbols. But no speech performance. In none of these cases is X involved in a language situation as the hearer or reader. He is not adjusting himself to linguistic stimulation. X is neither engaged in conversation nor is being commanded or requested. His reaction is a psychological response to an event, precisely as when he sees the lightning and hurries home to avoid a drenching. Insofar as there is language in these illustrations they may be called symbols in no other sense than that they signify some significant.

When we agree that psychological language is behavior and not a set of symbols, we are not denying that we can symbolize any kind of data. Much of our knowledge must be organized in the form of such contrived relationships. This is as true of the facts of speech as of other kinds of data. Surely it is possible to abstract all the actual

content of a stimulus and response event. It is no great feat to make the speaker's action, which ordinarily is a stimulating response, into a signifier as a fixed correlate to an object as significant. But what value has this procedure for linguistic description? None at all. It is merely forcing a symbological relationship into an event, and notice that the object may just as well be made the signifier as the significant.

How then can the symbolization of speech be justified? How can symbols be employed to describe language? Only by weighting down the symbols with definite linguistic content. In this manner the symbology of language becomes synonymous with linguistic psychology. For example, it is assumed that what the speaker does is to act in such a way as not only to symbolize the reference, but to express an attitude toward the listener and referent, to bring about effects in the listener, and to make the reference in the easiest and best way. While the symbolist may reject as irrelevant some of the psychological factors, he may put in a sufficient number to make his symbology correspond pretty closely to a language situation. But here pure symbological relations are not being discussed but something else. All this is done with the explanation that symbology involves context. In other words, symbology is no longer regarded as the science of relations. Nevertheless, these manipulations enable us to see the likenesses and differences between symbolical and referential language.

Of a surety, symbolism is not to be confused with referential language or speech. But on the other hand, if we think of symbology as including the behavior of encoding and decoding of signs to make objects into symbols, then symbological situations can be transformed into surrogative language. In Chapter VII we consider at some length that type of language. At this point, however, we wish to reiterate that the introduction of a psychological factor does not transform a symbological situation into referential activity. Observe that the psychological activity here refers to the intention of setting up a symbol to puzzle or enlighten someone. It is precisely like putting a red light upon a pile of debris at sundown. The intention of warning somebody or the desire to avoid an accident is not language behavior. No more is the act of taking an object from one place and putting it someplace else.

MONITORIAL SYMBOLISM

An exceedingly important connection between symbolism and speech is that revealed in the monitorial function of words or symbols. When a person speaks of God, beauty, or freedom, a proper correlation should exist between the language and the objects spoken of. When the objects actually exist, then the words must explicitly refer to them, while if they do not, the speaker should at the very least articulate in a blameless manner. Semasiology or semantics properly argues for the appropriateness and serviceability of words or phrases. The goal of such a study is to avoid error or misunderstanding in the use of language in order not to mislead oneself or other people. One is not then controlled by words; nor does one substitute words for things. Such a study of semantics culminates in the refinement of word usage. Thus it serves the same purpose as refinement of symbolization in logic and mathematics, in which clear thinking and proper calculation are the targets aimed at.

The admonitory advice may be extremely serviceable. Proceeding from word symbols to speaking acts, it is well to warn speakers to be careful in their speech. Since speech is adjustment to surroundings, care should be taken to adapt oneself well. Since speech is referential action, the semasiologist might well assume that the laws of signs apply also to speech. But this monitorial function must not be too rigidly exercised. Semantics can only be very generally applied to living language, since it will not tolerate any taskmaster.

What is really involved in the monitorial conception of speech concerns the circumstances in which speech functions. Speech operates in numerous human situations. Persons speak in order to exercise themselves as well as to transmit orders down a military hierarchy. In the latter case, speakers serve merely as relays, walking and talking machines. Though they must transmit properly or exactly, their own reference adjustments are not involved. They are merely serving someone else. Similarly, when one is really interested in telling someone about something, there is a demand for a proper knowledge of the thing and its communication. Here it is admitted that speech must be rigid and conventional if not formal. But notice that in this instance speech loses some of its most

striking characteristics. Lilke the arctic explorer who in an emergency must diminish his lilfe processes in order to continue to live at all, one must sometimes speak without vigor and spontaneity. Such are the exigencies for adjusting oneself to situations.

EQUIVALENCE OF LINGUISTIC FACTORS

Is it certain that the eight linguistic phases we have isolated complete the entire series? This is no irrelevant question, though it pales into insignificance beside the problem of the equal importance of these phases.

We believe that to take the position that some factor is more and another less important necessarily leads us into numerous difficulties. While it is but natural for a student of one of these phases to overemphasize the importance of his own field, to yield to such an attitude is to court serious confusion.

Shall we not then agree that all of these linguistic aspects constitute coordinate features of language? For the psychologist it is quite clear that the behavior feature is the all-important one. But obviously behavior is limited and conditioned by convention. Thus grammatical and lexic conditions give form to speech behavior. In a similar way the sociological and anthropological linguistic features give character to the specific actions of particular people. Again, as interbehavior, responses cannot occur without stimulation; it follows that many of the other phases may be regarded as the stimulational factors coordinate with the behavior or response aspects. Similarly, the vibrational aspect of language utterances may be looked upon as the media for psychological conduct. We propose, then, to disregard questions of relative priorities, but proceed at once to a study of linguistic interactions. However, we must first devote the next chapter to an exposition of the essential characteristics of psychological interbehavior.

Chapter III

The Psychological Foundations of Language

PSYCHOLOGICAL POSTULATION

Psychological linguistics cannot be more valid than the general psychological principles upon which it is based. It is important, therefore, that we should be fully aware concerning the sort of foundation upon which we plan to erect our linguistic superstructure.

Now the determination of scientific foundations is the ordinary process, which every science must go through, of setting forth postulates. Postulates constitute propositions stating the fundamental assumptions that guide the scientist in his observations and interpretations. The sum of such postulates comprises the reference field in which a scientist works. Science as achievement may be regarded as a series of propositions constructed accurately to record and organize the events dealt with. The system thus erected is conditioned in scope and validity by the postulates accepted. In the domain of psychology there are three fundamental forms of postulation capable of being employed in the study of language. These are: Mentalism, Behaviorism, and Interbehaviorism.

The writer assumes that linguistic phenomena cannot be based upon either Mentalism or Behaviorism,[1] which have been the dominant views in the psychological field. The former is concerned primarily with the expression of hidden mental or psychic states, and the latter with the operation of the anatomical organism. After passing in review these two conceptions and the objections to them, we shall indicate the psychological view which we accept as satisfactory for linguistic psychology.

MENTALISM

From the mentalistic standpoint, language is regarded as verbal or motor manifestations of psychic entities. This viewpoint is

[1] Whether implicit or explicit.

expressed in the conventional dictum that language is a means of conveying or communicating thought.[2] These verbal actions are further regarded as crystallized so that language is defined as a set of symbols representing thoughts or mental states. Is this a satisfactory description of such dynamic activities as linguistic behavior?

It is agreed that the method of science is none other than taking notice of happenings or events, and then assimilating them into our knowledge system. This means in effect to ascertain the nature or construction of events or things and to describe them not only by themselves but in connection with other things. The latter form of description we dignify by the term explanation. The limits of our description and explanation are set, of course, by the nature of the problems instigating our investigation and the status of our existing knowledge.

One imperative condition is imposed upon the scientist. No matter what feature of some actual happening he may choose to study, he must start with a concrete thing or event—confrontable and observable. No scientific work can begin without a crude datum,[3] the indispensable requirement of which is that it should be a definite occurrence or event. Are states of consciousness, awareness, or feeling such occurrences? Do such psychic states exist as crude data in the sense outlined above? Rather, are not these putative states really acts of knowing or reactions of feeling with respect to things or other persons?

It is only natural that mentalistic psychologists, at least verbally, assimilate the notion of awareness acts, but in that case they should attempt to describe such acts as actual behavior of organisms. In practice, of course, they persistently think in terms of psychic states. Is it descriptive of an act of being aware [4] of this book

[2] In recent years there is a manifest tendency to enlarge this proposition to read "language is a method of communicating ideas, emotions and desires."

[3] Crude data may involve, of course, the most abstract things. Scientists may study the most far-fetched objects of mythological tales. Here the crude data are the beliefs or tales of persons—in other words, actions of individuals. Through the study of behavior the scientist can even catch in his net the nonexistent and the nonexistable.

[4] Granted that awareness acts are subtle phenomena, but this fact does not warrant making them into something that they are not—namely, states of consciousness. We have satisfactory descriptions of such acts. See Kantor, J. R., *Principles of Psychology*, Bloomington: Indiana U. Press, 1924–6, Chaps. on Sensing and Perceiving; and Kantor, J. R., and Smith, N. W., *The Science of Psychology*, Chicago: Principia Press, 1975, Chaps. on Perceiving Interactions.

to say that in a "mind" there is a state of consciousness or awareness?

Without doubt the greatest objection to the concept of mental states is that such states are pure fabrications, verbal constructions and by definition they are transpatial. They are not ensconced in a concrete space-time manifold. Accordingly, the crude data of active speech become verbally transformed into something else. Were this not the case there could be no place in linguistic descriptions for the expression of something by means of words. If, however, we keep to actual linguistic events, we can construct propositions concerning acts of speaking and being spoken to as definite interbehavior of persons.

The conventional method of escape from the difficulties accruing to the conception of mental states is to hide behind the cloak of concepts. Mental states, it is said, are scientific constructs symbolizing certain features of linguistic behavior. One is constrained to ask, however, what is the significance of that which departs so far from the events concerned, especially when it is not an aid to comprehension of the phenomena studied, but on the contrary leads to their misinterpretation? Though we are not interested in a comprehensive discussion of the difficulties of the mentalistic conception, we may add that the entire commerce with mental states belongs to metaphysical and not scientific thinking.

At least since the dawn of biological-evolution days, psychologists have been sensitive to this situation. Accordingly they have attempted to connect psychological states as closely as possible with bodily activities. Some psychologists have gone so far as to translate psychic states into bodily action. It has been proposed that mental states are identical with actions of the nervous system. Look at it from one side, they say, and you have consciousness; look at it from another, and there is only neural action.

No present day mentalistic psychologist, it is safe to say, is satisfied until he has at least asserted that mental states have a physiological basis. And so the nervous system is made to accept that doubtful honor. All sorts of explanations of how mental states arise, operate, and are related, have been offered in terms of hypothetical neural interpretations couched in terms of grooves, neural connections, synapses, and neural configurations.

In all this procedure one light stands out clearly—namely, that the most confirmed mentalist realizes the futility of adding to bodily action some sort of mental or psychic factor. Thus his zeal in attempting such a conjunction. But what becomes of his efforts? Nothing more than the realization that there are no mental states that can be separated from, identified or conjoined with neural or other organic action within the linguistic domain.

BEHAVIORISM

The behaviorist, keenly alert to the difficulties of mentalism, asserts that the conjoining efforts of the mentalist avail nothing and that psychic materials are not the subject matter of science. Because mental states are transpatial they are ruled out of the natural science domain. Accordingly, the behaviorist confines his descriptions of the psychological datum to the operation of anatomical and physiological mechanisms. Thus, in the early period of the current behavioristic movement, psychological phenomena were described as the activities or functions of particular organs, and were later enlarged to include the activities of the total organism. Such a viewpoint is tantamount to the reduction of psychology to physiology.

The mentalists, at bay, turn to attack. They impeach the behavioristic position on the ground that a psychological datum cannot be exhausted in the description of exclusively bodily actions.

Since language is our special concern, let us consider this mentalistic criticism as it applies to linguistic events. There seems to be considerable merit in the mentalistic contention. According to behaviorism, speaking consists of the operation of such anatomical mechanisms as the vocal organs, the brain and nerves plus the sense organs, and the operations of the mouth, teeth, lips, etc. It is by means of such mechanisms that speech is emitted.

Language responses must assuredly involve all these anatomical and physiological processes, but they are only participating factors on the side of the speaker. They are phases or aspects of spoken or heard language, and operate in all situations as components of entire organisms, and never as partial local determinants of any type or phase of behavior. Linguistic behavior is much more com-

plicated action than the mere operation of anatomico-physiological mechanisms.

And so while the behaviorist is entirely within the realm of concrete facts, the behavioristic position as thus outlined requires much amplification. The lag in scientifically handling such familiar and frequent occurrences as speech with their problems of content, significance, and meaning,[5] calls for a different psychological foundation. We suggest that interbehavioral psychology constitutes an appropriate basis for scientific linguistics.

INTERBEHAVIORAL PSYCHOLOGY

According to interbehavioral psychology, a psychological datum is always a definite event with at least two things in interaction. One of these is, of course, a psychological organism, whose action is called the response. The name stimulus is given to the function or action of the object which interacts with the psychological organism. This is the essence of interbehavioral psychology.

RESPONSES AND RESPONSE FUNCTIONS

One phase of the psychological datum is familiar to everyone. We refer to the actions of the responding organism such as grasping, walking, reaching, kicking, throwing, believing, remembering, thinking, etc. We may be fairly confident that such actions are readily recognized as modes of behaving with respect to things.

Possibly there are those who are not yet accustomed to regard thinking, believing, and remembering, as actions. But consider that although such behavior is subtle, it is nonetheless performed by way of an individual adapting himself to surrounding objects.

STIMULUS FUNCTIONS

Now what is the action of the stimulus object in psychological interbehavior? It performs a corresponding function to a response function. Let us illustrate with the least ambiguous case. Here are two fencers interacting with one another in mutual interstimulation. Start with A stimulating (thrusting his rapier), toward B, who performs a defense act. Then B's action stimulates A, whose reciprocating response is again a stimulus for B. Regard the process as continuing for a considerable interval, the actions of each individual functioning to call out responses in the other.

[5] The word "meaning," as used, is an English language term. For the discussion of the scientific character of linguistic meaning, see Chap. XIII.

The stimulus function is no less clear when the interaction falls short of this elaborate drama. An individual may be interacting with another individual without any close contact between them. A merely observes B in the act of swimming or running. Naturally the stimulus object in this case corresponds to a subtle form of response. When the thing with which the person interacts is a nonliving object, we may regard the interaction as occurring on a less obvious level. But so far as stimulational effect is concerned, the result is the same, to wit, in each case an interaction is taking place.

Let us go to the bottom of the interactional scale. Take the case of the person interbehaving with a stone lying in the road. He at least perceives (looks at) it. Who can deny that the object acts upon the person? No competent observer. For there is no question that the stone exerts an effect upon him—in brief, participates in a conjoint action. More important still, the action of the stone matches a specific form of response. The action of a particular perceiver may be an entirely different kind of act from that performed by some other organism or person. Obviously the illustrative act is different from that which the same person performs when perceiving another individual. Let us not forget that psychological behavior is always interbehavior. When A looks at a thing, that object is just as much involved in a dynamic event as when he grasps, kicks, or throws it.

Doubtless there are degrees of action performed by the stimulus object when measured in terms of actual physical energy expended by things. The object operates in the smallest degree when it is merely lying in the road. A greater degree of stimulational action on the part of the object occurs when through natural conditions it slides down a hill upon someone, or through human agency strikes one with inerrant accuracy. This distinction correlates with the distinction between degrees of energy expenditure mentioned above.

However, we should be missing the point entirely if we regarded the amount of energy expended by an object as adding to the principle of its effectiveness as a stimulator. True it is that in some cases the complexity and importance of a response are functions (in a mathematical sense) of the energy expended by the stimulating object. But not always. An artist may perform a far more agitating and important reaction to a picture hanging on the wall than to some other object expending the greatest amount of energy.[6] The principle of stimulus and response, therefore, is independent of the type of action of the stimulating object. In other words, psychological events are primarily characterized by their interbehavioral character, and, while they are all subject to the Newtonian laws of mechanics, the interactions are not merely mechanical actions.

We come now to the heart of the whole interbehavioral event. Each interaction is always absolutely specific. What the reacting organism and the stimulus object do in each interaction constitutes a distinctly unique relational happening. Not only are the responses of organisms and the functions of stimulus objects mutually coordinated, but the whole interactional event is adapted to the surrounding circumstances. What one means by a psychological fact or mentality is practically summed up in this mutuality and reciprocity of action.

EVOLUTIONAL ORIGIN OF RESPONSES

Whence comes this unique interactional occurrence? The answer: Psychological phenomena are historical or evolutional. Every psychological event represents historical interrelations of the organism with what stimulated him at a particular time. As soon as an individual is born he comes into contact with objects. As a psychological organism he is sensitive to the qualities of things, which is equivalent to saying that qualities have an effect upon him, and in consequence he acts differently with respect to different objects.

[6] Conversely a large expenditure of energy of the stimulating object may produce a slight and unimportant reaction in the psychological organism. The inverse relation of energy expended by a stimulus with respect to the reacting organism may be taken as one mark of differentiation between psychological interactions and the interactions of physics. In the latter case, of course, the energies expended must be equal. But this point must not be carried too far.

Such early interactions with objects result in building up a set of unique responses to these particular things.

Naturally, since the first contacts are very simple, the resulting psychological interactions are correspondingly simple. Sometimes the experiential relation between organisms and objects neither broadens nor deepens. With respect to some things, A may be as innocent in his old age as he was in infancy. He knows them on the surface. They produce no profound effects upon him. His reactional equipments concerning such things therefore do not change. But with regard to other things, his interactional relations grow incessantly. Not only do they increase, but they also become complicated. As A discovers additional qualities in a thing these characteristics stimulate new responses. Likewise the object means more to him. It calls out deeper understanding, more effective reflection.

Language behavior originates in a similar historical manner. Every word A utters, every sentence he speaks, has its history. Every conversation he holds stands as witness to the mutual interbehavior he and his referents have passed through. This is why out of his mouth you can convict him. Recall the shiboleth-siboleth story. We must not, however, fail to observe that language behavior is not in any essential way correlated with the natural qualities of objects. The same objects are linguistically interacted with differently by members of diverse psychological and societal communities. Language is, of course, not unique in its arbitrariness and artificiality. The entire study of social psychological activities is devoted to the observation of communally conditioned ways of behaving with things, in most cases with wide variance from any plan which the nature of things might suggest.

EVOLUTIONAL ORIGIN OF STIMULI

Such, then, is the origin of any reaction we may observe to happen.[7] Through these evolutional interactions the stimulus functions of objects are likewise developed. Because of the numerous circumstances under which persons come into contact with things and events the latter become endowed with all sorts of stimulus functions.

[7] Some reactions may be performed analogically. For instance, the child upon first encountering a pony may call it a big dog.

INFLUENCE OF SETTINGS UPON INTERBEHAVIOR

From the facts of interbehavioral evolution it follows that the same individual can interact in many ways, even with the same object. Which particular interbehavior occurs at any particular time? The same question arises when we consider that at any moment many different interactions may occur with different objects present, even if only one form of interbehavior is available between the person and any particular thing. In either case the setting or background of the interactional situation is the influencing factor. For instance, of the many names which a careless driver can stimulate one to call him, only those which can be conventionally expressed in the presence of ladies (if any are present) may actually be uttered.

THE PSYCHOLOGICAL ORGANISM AND INTERBEHAVIORAL HISTORY

Our exposition has already made plain that according to interbehavioral psychology, a psychological organism is a biological individual who has built up a large series of behavior configurations in interaction with things and persons, and consequently performs those activities when the original situations reoccur. Now, if we care to predict the behavior of an individual we may do so if we are acquainted with his psychological evolution. Thus we address an Englishman or a Frenchman in his own native language because we know what his psychological equipment is. This equipment we call psychological organism. A psychological organism therefore may be defined as a sum of psychological responses. It is convenient to use the term personality to designate the great series of interbehavior equipments. This reactional equipment is really the record of the individual's psychological evolution. It is through his interbehavioral history and reactional biography that the individual develops his particular seeing, hearing, and speaking reactions.

INTERBEHAVIORAL HISTORY FOLLOWS BIOLOGICAL EVOLUTION

As an evolutionary process the psychological development of an organism may be regarded as a later phase of general development.[8] The ability of an organism to interact with things in the manner described here is a result of biological evolutionary processes through long geological ages. Through a long series of biological and geological happenings there have arisen the species of animals complicated enough to participate in psychological interactions issuing in the performance of effective and subtle psychological adjustments.

We must not, however, oversimplify matters. We have no more right to speak of these biological processes as producing a psychological organism than we have to assume that the early motions of the nebular masses which resulted in the solar system were developing biological things or activities. What we have so far are merely the conditions which occur before psychological organisms and psychological actions can arise.

Lest we forget. Psychological events are absolutely unique events. And so in order that a psychological reaction should occur, there must always be present the personal biography of the individual. Since a psychological reaction consists of specific movements, particular poses and gestures—in brief, unique behavior configurations—these can only be developed in the intimate interactions of the individual with surrounding objects.

CULTURAL FACTORS IN PSYCHOLOGICAL DEVELOPMENT

So far we have spoken only of psychological potentialities. In order, then, that the organism should be able to think, remember, or speak, it is further necessary that the human animal should be civilized. Civilizational processes begin when the animal has biologically and geologically risen on the evolutionary ladder. This civilization in all of its characteristics may also be regarded as a prior condition for the development and operation of all kinds of human responses, including speech reactions.[9] In other words, we may assume that human language, as well as other complicated inter-

[8] See Kantor, J. R., The Evolution of Mind, *Psychological Review*, 1935, 42, 455–465. See also Kantor, J. R., and Smith, N. W., *The Science of Psychology*, Chicago: Principia Press, 1975.

[9] Perhaps we should say, rather, that civilization and complex psychological phenomena develop simultaneously. For specific reactions, however, we may say civilization is a prior prerequisite of development.

behaviors, are events engendered only under civilizational conditions.

Result: if the actual psychological fact is an evolved interbehavior as we have outlined it, then it is clear that we may cheerfully extrude from the psychological domain any psychic factors without omitting any essential feature. On the other hand, insofar as the interbehavioral conception appears valid, we have a natural science basis for the study of psychological linguistics.

LANGUAGE AS INTERBEHAVIORAL EVENTS

As psychological phenomena, language constitutes specific types of adjustmental behavior. Like all other psychological facts, linguistic phenomena consist of the interactions of persons with stimulating objects. These adjustments are in principle the same as when individuals throw something or run away from a menacing animal. Linguistic interbehavior, like other psychological phenomena, constitutes autonomous events with their own unique characteristics.

In origin, linguistic interbehaviors are definite items of evolution. At least all normal human organisms are biologically equipped to move, make gestures, and vocalize. Furthermore, they can distinguish words or sounds and respond to them differently. Organisms can also repeat the sounds or perform the identical reactions of another individual. Finally, the organism can perform such responses when occasion demands. This involves merely doing the same thing as the other organism in the presence of an object, or repeating what one has previously done in similar circumstances. This linguistic act is precisely like performing any other action. Learning to speak in the sense of performing verbal responses is the same as learning to walk or manipulate something.

Some types of responses, like walking, require very little interbehavioral development, since they are pretty close to being the sheer exercise of anatomical structures. Or, better put, they are mere movements of the organism. Not so in the case of speaking. Here the activity is much more complex, and what is done in the way of psychological adjustment constitutes action far removed from the sheer exercise of anatomical parts. The distinction may

be illustrated by comparing mere vocalization or shoulder shrugging with genuine communicative speech.

Linguistic reactions as adjustments therefore constitute specific responses to particular stimuli. The mere fact that we perform them as verbal or auditory-motor responses makes a difference only of type, but not in behavior principle.

For example, an object within reach stimulates someone to grasp it. Similarly, an object out of reach stimulates the individual to walk toward it. In other words, varying stimulational situations prompt different actions. The same thing is true in language behavior. Word reactions depend upon the particular adjustment needed for current stimulation. Thus when one wants to secure an object which one does not care to obtain by one's own efforts, one asks someone else to get it for him. Here language operates as substitutional behavior. Instead of reaching for the book or walking to get it he refers someone else to it, in order to obtain it. What one says in detail depends upon the specificities of the adjustmental circumstances. Psychological language, therefore, means referring to things and events in one's surroundings for various purposes, perhaps for sheer expression, or as in the above example, to avoid exertion. In either case we have a distinctive form of common adaptation to specific stimulational conditions.

Human speech interactions constitute complicated adjustments since they are involved in intricate human situations. They presuppose human interests and human happenings set in specific civilizational circumstances. This civilizational background influences the sorts of things spoken of, what one says with respect to them and the particular form of language reaction. In other words, the stimuli for language responses are localizable in particular human situations and circumstances.

Now depending upon the auspices of his interbehavioral history the individual builds up a linguistic equipment classifiable as English, French, German, Swahili, or Chinese, or a variant under the general class. In consonance with these linguistic equipments individuals also build up equipments of manners, ideas, etc., which mutually influence linguistic performances. As we have already indicated, the presence in the individual's cultural milieux of ideas, beliefs, sacred (religious) and profane (industrial, military, etc.)

practices, as well as every variety of thing and process supplies the basis for the development and performance of linguistic as well as nonlinguistic adjustments.

In the light of these facts there appears to be no point to the idea that language is the translation of a "psychic" something into motor responses of an individual. Nor are there "psychic" factors which are accompaniments of verbal or gestural speech. Those who hold to this objectionable doctrine no doubt attempt to escape its difficulties by hiding behind the popular expression that we communicate our thoughts. It is the height of folly, however, to permit an everyday idiom to confuse thinking. While it is plain that by A speaking to B, B knows that A thinks Mr. Doe is an honest man—in idiomatic speech A communicates his thoughts to B—this performance in no sense constitutes a translation of a psychic element into a verbal motor act. It happens here that there are two kinds of actions which A is performing. "Having an idea" is itself a misleading manner of speech. An idea is an act A performs, and not a "psychic" something, in or connected with his brain, that somehow gets converted into motions of his lips. An idea is an intellectual response. In our illustrative case it is taking the stand or assuming that Mr. Doe is an honest man. The other act (language) is one in which A refers either to the fact of Mr. Doe's honesty or to A's attitude (reaction) toward him.

It is only by arbitrarily dragging in some mentalistic conception in the description of these two related activities that one perpetuates the expressionistic error. Succinctly, that error is considering the act of talking as a translation of the psychic material into motor action of the tongue and lips. The first requisite for genuinely understanding language is to rid oneself of this false conception.

It may be helpful in achieving a proper attitude toward the relationship of thinking and speaking to notice that this connection is only a special instance of the interrelation of language with other forms of psychological adjustment. While linguistic acts constitute a distinct form of psychological response, they operate in all sorts of situations.

As conversational adjustments, linguistic acts are prominent features of interpersonal intercourse. In this sense they bring persons into close relations of all varieties. We might even say that

language reactions constitute the primary form of distinctly human performances. Persons may talk to each other for sheer entertainment, to convince each other of something, or as a means of mutual aid to carry on all sorts of work and play.

Language reactions also constitute a large share of adjustments to aesthetic situations. Whether we regard poetry as the artist talking to himself or to others through the medium of song, or whether we merely think of him as writing to us concerning his feelings or the beauty of nature, in either case we have linguistic behavior operating in the service of art. The extent to which the dramatist uses conversation as the medium of his art is apparent to everyone.

Enough. Once we are committed to the idea that language constitutes actual adjustments we readily see that they constitute features of every variety of human situation, just as economic, technological, social and other activities do.

Chapter IV

The Analysis of Linguistic Fields [1]

THE BASIC UNIT OF PSYCHOLOGICAL SCIENCE

Granted that psychological linguistics concerns the observable interbehavior of persons with objects in specific types of behavior fields, we face the problem of analyzing such fields in order to uncover the component factors or variables. Essentially this involves the definition or description of a unit of psychological interbehavior which is called a behavior segment. For our present purposes we may present the essential facts about linguistic performances and adaptations by describing the following six items:

1. THE SEGMENT OF INTERBEHAVIOR
2. STIMULUS OBJECTS AND STIMULUS FUNCTIONS
3. RESPONSES AND RESPONSE FUNCTIONS
4. INTERBEHAVIORAL MEDIA
5. INTERBEHAVIORAL SETTINGS
6. REACTIONAL SYSTEMS

THE SEGMENT OF INTERBEHAVIOR

The unit of psychological action is a segment of behavior since the behavior of individuals is continuous from shortly before birth to death. These segments of behavior constitute interbehavioral fields. The primary factors consist of the interaction of organisms with things, other organisms, and conditions which constitute the stimulus objects. The diagram in Fig. 1 illustrates the psychological fields as segments of behavior.

These segments of behavior are divisible into simple and complex types. The simple type consists of just one act unit of the organism

[1] The material in this chapter is abbreviated from Kantor, J. R., and Smith, N. W., *The Science of Psychology*, Chicago: Principia Press, 1975.

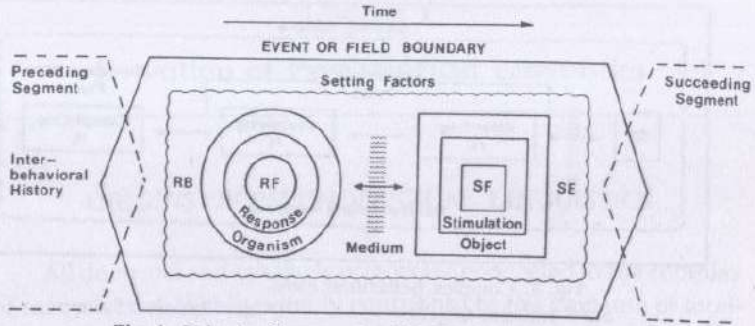


Fig. 1. Behavior Segment (or Unit Psychological Event)
RB = Reactional Biography; RF = Response Function;
SE = Stimulus Evolution; SF = Stimulus Function

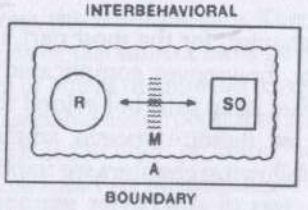


Fig. 2. Simple Reflex Action.
R = Response of Organism SO = Stimulus Object
M = Medium of Contact A = Interbehavioral Auspices

with a corresponding single function of the stimulus object. A good example is the jerk reflex when the organism inadvertently gets into contact with a hot object, for example, a burning candle. See Fig 2.

The complex type of behavior segment always involves at least three response units. As the accompanying diagram (Fig. 3) shows, the typical complex behavior segment consists of two phases, the first of which consists of two precurrent act systems, an attention act unit and a perceiving act unit. These two are followed by the second phase, called the consummatory reaction system.

The diagram signifies that before an individual performs an act, say lifting up some object, he must attend to the object, then perform a perceptual act, that is, identify the thing he is to pick up, and finally the consummatory act of actually lifting the object.

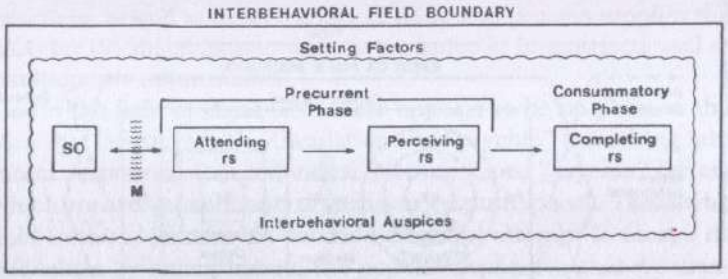


Fig. 3. Complex Behavioral Field.
SO = Stimulus Object rs = Reaction System
M = Medium of Stimulation

INTERBEHAVIORAL SEGMENTS AND INTERBEHAVIORAL SITUATIONS

Linguistic behavior, for the most part, involves more than one behavior segment, howsoever complicated the segments may be. We refer to this fact as an interbehavioral situation. This is true for both referential or definite speech language and for symbolic behavior. In the following chapters we indicate the essential details of each of the factors in a behavior segment.

OBJECTS, STIMULUS OBJECTS, AND STIMULUS FUNCTIONS

For a proper understanding of psychological behavior, it is important to distinguish between objects, stimulus objects, and stimulus functions. Whenever an organism interacts with something, that object and the corresponding action subserve unique reciprocal functions which have been developed in previous encounters. A nail that is to be driven into a wall is not merely an indifferent metallic object, but a thing which requires hammering and not screwdriving actions.

ACTS, RESPONSES, AND RESPONSE FUNCTIONS

Just as the stimulation phase of psychological interbehavior is distinguished into three definite factors, so the organism's action must be similarly divided. The acts of organisms are very specific

and consist of responses directly reciprocal with the behavior or functions of stimulus objects. Response functions are well illustrated by the differences between the act of raising the arm in friendly salute or for defense in combat. It is these intimate functions that characterize psychological action from other kinds, and unfortunately it is these specifities of behavior which have given rise to the illegitimate notions of mental processes.

INTERBEHAVIORAL MEDIA

Assuming that the individual has developed the capacity to perform certain actions and at the same time there is present the stimulus object with which he is interacting, there must be also media or means for the actions to occur. An excellent example is the presence of light media when one has to differentiate between the colors and forms of objects, action that cannot occur unless there is a light medium. An individual may have before him a brightly colored flower, but if the light is withdrawn he cannot differentiate the color and could not react by naming it if asked to do so.

INTERBEHAVIORAL SETTINGS

We have already indicated that psychological actions not only consist of specific responses and functions, but they also must be adequate for certain situations. These situations we call the setting factors. In the performance of language behavior, certain utterances may or may not be fitting for the occasion. For example, the word "rascal" may be uttered when some individual wishes to insult someone, but when a fond mother calls her child "a little rascal," the setting or situation marks a very different kind of activity.

REACTION SYSTEMS

Just as behavior segments, with all of the factors which we have just enumerated constitute the units of psychological interbehavior, so the behavior of the reacting individual consists of a number of reaction systems, except in the case of reflex action. These reaction systems constitute the units of action irrespective of the stimuli or

the setting factors. They consist of a grand synthesis of muscular, glandular, neural, receptorial, and other anatomico-physiological movements of an organism, as we have described them in Chapter IX.

Although as a rule reaction systems occur as components of specific behavior segments, they are somewhat independent of the more comprehensive fields of psychological adjustments. For example, similar vocal utterances as represented by such grammatical units as "the," "man," "went," "quickly," "slowly," and so on, may serve as components of either positive or negative speech. On the other hand, comparable linguistic adjustments may alternatively comprise very different reaction system components, for example, utterances like "yes," "certainly," as compared with "uh uh," or a head nod.

It may be of some interest to point out here that behavioristic psychologists in the early days of antimentalistic psychology implied that the activity of the organism in any psychological situation consisted only of reaction systems. They disregarded the proper functions of both action systems and of stimulus objects. They assumed that stimulus objects were simply causal agents to put reaction systems into operation.

Chapter V

Evolution of Psychological Linguistics

ORIGINS OF PSYCHOLOGICAL LINGUISTICS

All doctrinal and scholarly origins are concealed in the complex of many factors that inevitably contribute to the nascense of intellectual things and events. Certainly this is the case when we study psychological linguistics. Although we should expect psychologists to concern themselves seriously with the history of the omnipresent linguistic behavior which constitutes such important features of all psychological situations, this is not the case. Throughout psychological history the votaries of the subject have neglected to foster the study of the evolution of one of the most striking types of psychological activity. It is a reasonable assumption that this can be accounted for by their acceptance of the myth of "mind" which precludes the study of actual behavior and its development.

The specialized and technical development of psychological linguistics may be traced back only to the middle of the nineteenth century when the philosophers interested in social institutions constructed the discipline of Folk or Social Psychology. It is to be noted, then, that social psychology and its linguistic branch were both born under metaphysical auspices. Psychological interest in language was centered in the social or group "soul" or "mind" of which language was one of the faculties, functions, or manifestations.

Along with myths and customs language came to be considered reactions or products of a general human "mind." In the course of the nineteenth century great interest was developed in man, in his condition and activities. Naturally it was observed that laws, customs, myths, religions, and language, in short, all of what we have since learned to call social institutions, though connected with individual psychological activities, are still independent of them. Language, custom, myth, etc., while indubitably human phenomena, are nevertheless independent of and prior to human individuals, and develop from age to age.

Although we cannot at this point follow through the historico-cultural developments of social psychology, we may indicate some of the interesting interrelations between certain prominent figures in psychology and in the general Romantic movement in Germany. For example, it is instructive to consider the connections between Steinthal (1823–1899) and W. von Humboldt (1767–1859) who is credited with the origination of the name "Völkerpsychologie." More generally, it is important to dwell a bit on the relationship of the von Humboldts with the general Romantic movement in Germany and the further relations between Romanticism and Herbartian Realism.

PSYCHOLOGICAL LINGUISTICS AND FOLK PSYCHOLOGY

HERBARTIAN PSYCHOLOGY AND LANGUAGE

The formal development of the psychological study of language may be traced back to the exceedingly learned and most extensive writings of Steinthal who with Lazarus (1824–1903) is indeed responsible for the formal development of social psychology itself.[1] Steinthal looks upon language as one of the elements or processes of the social mind along with mythology, religion, customs, laws, etc.[2] Psychology for these writers, who in general are followers of Herbart (1776–1841), consists of the study of elements which are organized into and compose the mind. Language, accordingly, is psychic activity or process which these writers in contradistinction from their psychological authority, Herbart, consider to be independent of the anatomical and physiological nature and organization of the speaking individual.

The Lazarus-Steinthal linguistic psychology, as we have already implied, is concerned primarily with the origin of language. Its fundamental principle is that this origin is psychical and not historical or natural, in the sense of developing like a nation through historical events or like some organic object through natural metabolic and ecological processes. Language for them is a sort

[1] Steinthal, H., *Grammatik, Logik, und Psychologie*, Berlin: Dümmler, 1855, pp. 387 ff. and the references in those pages.

[2] Cf. the opening essay by Steinthal, H., and Lazarus, M., *Zeitschrift für Völkerpsychologie und Sprachwissenschaft*, 1860.

of product of the "unconscious" interrelation of human individuals much after the fashion of the existence of individual mental states through the mechanics and dynamics of the "ideas" or Vorstellungen in individual "minds," as propounded by Herbart.[3]

THE SHIFT TO VOLUNTARISTIC PSYCHOLOGY

The next great impetus to the psychological study of language we find in the work of Wundt (1832–1920). This writer approaches the general problems of folk psychology with the broad background of, and an intense interest in, physiological psychology. In consequence he studies the origin of language with an attempt to interrelate the social and individual mentalities. For Wundt, social psychology with its genetic aspects of cultural development constitutes a coordinate branch of psychology with the physiological-experimental field. Social psychology for Wundt,[4] therefore, is complementary to individual psychology and is not especially a study of the minds of different cultural groups as is the case with Lazarus and Steinthal.

As a result, Wundt opposed the Herbartian psychology with its intellectualistic mechanics, centering in the work of Steinthal and Lazarus and brought forth his voluntaristic conception. The latter is presumed to be based on a biological and evolutional theory. According to the Wundtian conception [5] language originates as external expression of affective mental states and then gradually develops into expression for complex ideational mental processes. Language for Wundt is not merely psychic action, but rather external (psychophysical) manifestations of mental states or the social products of psychic processes.

The above proposition holds so far as the origin and nature of language is concerned. With respect to the function of psychology in actual speech, in the development of sound changes or semantic modification, etc., there is no difference between Wundt and the Herbartians. Although Wundt severely criticizes the Herbartians [6] for not including psychological development in the treatment of

[3] Herbart, G. F., *A Text-Book in Psychology*, New York; Appleton, 1891.

[4] Wundt vacillated considerably on this point.

[5] Wundt, W. M., *Völkerpsychologie*, Leipzig: Englemann, 1904, Second Edition, Erster Band: Die Sprache.

[6] Paul, H., *Prinzipien der Sprachegeschichte*, Halle: Niemeyer, 1898, Third Edition.

language, his work from our standpoint is precisely like theirs in this respect. Aside from the problem of linguistic origin, Wundt merely takes philological data and attempts psychological explanations in terms of hypothetical psychic processes and developments.

SOCIAL BEHAVIORISTICS

Partially an outgrowth of the Wundtian doctrine of language development is the conception of language as a series of significant or symbolical acts. These symbolic acts or gestures are presumed to develop in a process of mutual give and take between individuals.[7] In this type of viewpoint, language consists of gestures or acts which are or have meanings. But on the other hand, language is not treated as actual responses for specific sorts of indirect adaptations. The behavior function is confined to the development of meaning in a conversation of attitudes. To a great extent this viewpoint constitutes an improvement upon the theory of language development as a general human function. It does not, however, concern itself with the manner in which the individual acquires modes of referential action which as significant or referential was developed entirely without his contribution or effort. The individual's ordinary language action consists entirely of the performance of referential action irrespective of the way in which it was developed. The person is presumed to use language as an action-tool which he finds available in his group just as he would use a canoe. His language learning is exactly like his paddling learning. He does not make language that in any sense involves deliberate constructions or any special reference to himself as a factor in the process. As a matter of fact, as we have indicated, the person acquires the reaction as a direct result of institutional stimulation. The existence of the institutions are only in part psychological phenomena and so the facts of language, insofar as they are the data of the philologist or anthropologist, possess their characteristics, in part at least, independently of psychological conditions. It is highly erroneous to regard confrontable and observable speech as exclusively a product of psychological processes. The actual character of verbal activity as psychological phenomena has been lost sight of, while

[7] Mead, G. H., A Behavioristic Account of the Significant Symbol, *Journal of Philosophy*, 1922, 19, 157–163.

language as intimate specific modes of conduct to particular stimuli has not been considered at all.

This social behavioristic viewpoint may be connected with a larger intellectual movement which concerns itself with the general development of meaning and cognition in social processes. Besides Professor G. H. Mead's (1863–1931) writings,[8] the movement embraces the writings of Baldwin (1861–1934)[9] and Royce (1855–1916),[10] and evidently goes back to a von Schelling-Hegel type of philosophical idealism.

SOCIAL FUNCTIONALISM

Very interesting and important developments in language have been worked out recently by ethnologists and anthropologists. These developments consist of the attitude toward and description of language as very definite functional activities in the lives of cultural groups or communities. Illustrative of this type of development is the work of Boas (1858–1942),[11] Marett (1866–1943),[12] Hocart (1884–1939),[13] and Malinowski (1884–1942).[14] While in all of these studies the functional character of language is stressed, there is, of course, no adequate psychological handling of such activities. There is, in other words, no treatment of language as concrete bistimulational individual responses.

PSYCHOLOGICAL LINGUISTICS AND DEVELOPMENTAL PSYCHOLOGY

Students of child psychology, even those uninterested in basic psychological problems, have contributed much to the evolution

[8] Mead, G. H., The Relation of Psychology and Philology, *Psychological Bulletin*, 1904, 1, 375–391; Social Consciousness and the Consciousness of Meaning, Ibid., 1910, 7, 395–405; What Social Objects Must Psychology Presuppose? *Journal of Philosophy*, 1910, 7, 174–180; and The Mechanism of Social Consciousness, Ibid., 1912, 401–406.

[9] Baldwin, J. M., *Mental Development in the Child and the Race*, New York: Macmillan, 1907, Third Edition. Also, *Social and Ethical Interpretations in Mental Development*, New York: Macmillan, 1913, Fifth Edition.

[10] Royce, J., *Outline of Psychology*, New York: Macmillan, 1903.

[11] Boas, F., *Handbook of the American Indian Languages*, 1911, Part I, Introduction.

[12] Marett, R. R., *Anthropology*, New York: Holt, 1911, Chap. on Language.

[13] Hocart, A., The Psychological Interpretation of Language, *British Journal of Psychology*, 1912, 5, 267–280.

[14] Malinowski, B., The Problem of Meaning in Primitive Language, in Ogden, C. K., and Richards, I. A., *The Meaning of Meaning*, New York: Harcourt Brace, 1923.

of psychological linguistics by their practical study of the language development of children. By observing the transition from random vocalizing and babbling to the utterance of conventional speech they have supplied valuable data upon which descriptive and interpretative propositions could be constructed.

As a matter of linguistic history, most workers in developmental psychology operate within the framework of conventional philology and hence describe the developing linguistic capacities of infants as passive adaptations to or imitations of the dialectal sounds and sentences of the group in which children are born. Nevertheless, the inescapable fact is that the similarities in the form or style of adaptive behavior is incidental to the wants, desires, or the general nature of the circumstances or situations in which the child finds itself.

LINGUISTIC PSYCHOLOGY TODAY

Current psychological linguistics is distinguished for its inclusion of objective psychology as a definite foundation for the study of linguistic behavior. In this matter it contrasts markedly with the traditional circumstances of earlier psychological language study. Whereas in the former periods of language study the psychological aspects of speech and intercommunication were either neglected and ignored or treated as correlates of psychic processes, there is now a period when linguistic events are described and interpreted with a clear view to scientific psychology. We describe briefly two prominent types of objective psychological language.

BEHAVIORISTIC LINGUISTICS

What may be referred to as behavioristic linguistics bases itself upon a psychological viewpoint generally known as Behaviorism. This type of psychological thinking stems from the reflexological investigations of Pavlov (1849–1936), Bechterev (1857–1947), and other workers. There are good and bad features of this movement.

On the good side, the outstanding feature is the departure, in intention at least, from the mentalistic tradition that has not benefitted language study, but on the contrary, has led to misconceptions and trivialities.

On the opposite side of the balance sheet is set down the futility of trying to account for the individual's speech development merely on the basis of rewards, pseudorewards, and punishments. One misses the description of language behavior in its essential characteristics and functions as types of adjustments among the many others that constitute the data of psychology.

INTERBEHAVIORAL LINGUISTICS

In striking contrast to conventional behaviorism, interbehavioral psychology consists of the general science of the development and performance of psychological actions by organisms in reciprocal field performances with respect to things and events in their surroundings. Accordingly, interbehavioral psychology demands that language studies be made and the results described precisely as such activities occur, while organisms perform immediate adjustments in specific behavior fields.

So much for language as individual referential reactions. When our interest centers in comparative problems, differences in speech, we have the problem of investigating the origin of the specific modes of referring to things and conditions. Here we find that the particular form of language behavior depends upon the specific human situations in which the speaker finds himself. It depends upon the kinds of things to which he refers in special cultural communities and, in addition, upon the cultural behavior institutions that condition how references can or must be made among sets of particular people. Furthermore, we require only the examination of the actual behavior of persons to discover how, through their various interactions, the language institutions change and thus in time come to be variations in the speech of a given community. In turn these altered linguistic institutions serve as original prose styles for later generations of speakers.

Section Two

THE PSYCHOLOGY OF LANGUAGE

Chapter VI

Referential Language

REFERENTIAL AND SYMBOLICAL BEHAVIOR

All linguistic phenomena evolve in the particular interbehavior contacts of organisms with the objects and events with which they are constantly and inevitably environed. This linguistic evolution we assume begins mainly by referential or indirect types of activity. Indirect behavior may be illustrated by comparing the activity of moving or kicking an object, with the effective manipulation of it, through the intermediation of another person. The essential feature here is that the speaker refers the other person to the need for manipulating an object, or to his desire to have the object moved. Instead of picking up the book, he says, "Hand me the book." We may regard this event as a mutuality of behavior involving two individuals and an object. It is to be noted, however, that the utterance is in principle a performance exactly like the direct kicking or handling something.

The linguistic evolution of the individual doubtless begins on a very simple level and only after elaborate developments reaches the peak of highly conversational speech. The earliest referential behavior is decidedly not vocal in pattern, but consists of hand and arm movements, or other gestural behavior. Obviously, all attempts to describe the linguistic development of an infant leave many gaps in the narrative, since the events concerned are subtle and recondite. Though we are reserving the study of this developmental record for a later chapter, we must indicate that at any point in the individual's behavior life all the variations of referential interbehavior occur side by side, even the historically oldest and simplest.

At the present juncture we are primarily interested in isolating an authentic case of referential interbehavior in order to investigate its essential characteristics with a satisfactory degree of precision. This referential interbehavior we believe is the basic fact in all the complicated speech of individuals who operate in milieux of systematized language patterns. To a great extent the psycholog-

ical linguist aims at a detailed description of how this referential phenomenon operates. He studies its origin in the evolving psychological individual, together with the influence upon the infant of the ethnic, family, and other auspices of his interbehavioral history. Naturally we find that in the very early years of the child referential activities take on highly specialized and conventional forms.

Our referential hypothesis assumes further that such indirect behavior is the nucleus and basis for activities far removed from simple referential adjustments. The manipulation of the most abstract symbology of mathematics or other systematic thinking is ultimately derived from such referential behavior despite the tremendous difference in the detailed operation of the various types of events. In fact, the psychological interbehavior involved in the manipulation of the most abstract terms and relations is in principle like that of vicariously handling stones. Our program calls accordingly for the study not only of speaking and being spoken to, but also for the investigation of the nature of symbolization and, in general, techniques of categorizing phenomena. In the present chapter we confine ourselves to referential interbehavior, leaving for the next chapter the symbological type of activity.

THE BISTIMULATIONAL HYPOTHESIS

At the basis of referential interbehavior is the psychological process of bistimulation. Consider a typical speech situation. A and B are viewing the exhibits at a Rose Show and the following dialogue ensues.

A (points to a specimen and says): What a beautiful rose!

B: Yes, it is a splendid new breed.

A: Who developed it?

B: A firm in Oregon.

It is to be noted that the utterances of both speakers are interrelated with two stimulus functions, one localizable in the just-pointed-out rose, and the other in B or A as the conversation proceeds. This series of speech events may be illustrated by Fig. 4.

Both stimulus functions operate simultaneously. We assume in this case that the rose is the primary thing to which A and B are adjusting themselves. We describe the object or event referred to

Fig. 4. Typical Referential Language Behavior.

as the adjustment object and as the matrix of the adjustment stimulus function (S_1). A and B in the same manner constitute the auxiliary stimulus object and the locus of the auxiliary stimulus functions (S_x) as they alternately behave as speaker or hearer.

Linguistic interbehavior contrasts with that in which the reactor merely perceives the rose. In that case the interaction constitutes a unistimulus contact with the object as illustrated in Fig. 5.

In referential behavior we have a unique situation in which two integrated interbehaviors are simultaneously occurring.

LINGUISTICS AS NATURAL SCIENCE

We propose that the hypothesis we have presented goes far in carrying us toward a natural science description of linguistic phenomena. Negatively considered, the hypothesis extrudes from the linguistic field any unobservable factor or condition not subject to

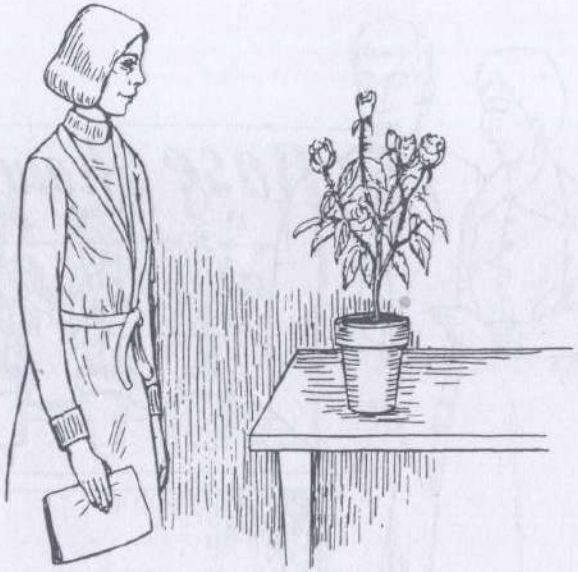


Fig. 5. Typical Perceiving Behavior.

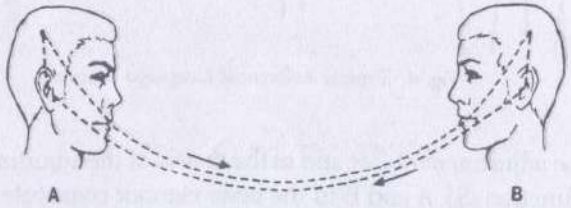


Fig. 6. De Saussere's representation of the processes of transforming psychic states into words and vice versa. From the *Course in General Linguistics*, p. 11.

observed analysis. On the positive side, we are led to study language as a definite event, every phase of which is directly observable or at least inferred from direct observation.

The accompanying diagram (Fig. 6), reproduced from de Saussure (1857–1913), represents the conventional idea of what occurs when persons speak. Notice that this conception implies that the "ideas" of A are somehow translated into words or are represented by words which are transduced to B as sound which must be transduced into ideas in B's "mind." B's "idea" is then transduced or encoded into words which are transmitted to A who decodes it into or as "ideas."

Traditional psychology centers its fundamental descriptions about the workings of the brain. The mentalistic psychologist believes correctly that when A utters the word "rose" his brain operates as a coordinating mechanism in the articulatory process. But then he goes on to the false analogy that thinking, which he regards as an intangible psychic process, is also paralleled by brain action. Furthermore, in addition to the mentalistic notion of connecting brain action with the unique event of thinking of a rose, he looks upon the brain as a prime explanatory basis for the translation of psychic process into brain action, and brain action into transcendental mentality.

Despite the implausability of such "explanations," linguists persist in thinking this way, though they use some different words. Here is an example from a volume published in 1970:

> The conversion of meanings into sounds allows human beings to transfer ideas from one to another. Ideas, I assume, have some kind of electrochemical existence in the nervous systems of individuals. Whatever their representations there may be, they cannot pass from one person to another in that form, for there is no direct neural connection between two separate organisms, no pathway over which ideas can travel in their original state. Language, like other communicative devices, provides a means of bridging this gap by converting ideas into a medium which does have the capacity to pass between one nervous system and another. John Locke made the same point a good many years ago.[1]

The "good many years ago" symbolizes a continuity of just three centuries. The traditional description is indicated in the accompanying diagram (Fig. 7). Observe that this type of explanation is full of mysteries which require to be set aside.

(1) In what sense can "ideas" be transmuted into words and transduced out of words? Are "ideas" things similar to the things spoken of or actions like word utterances, or something altogether different? (2) Are there one-to-one correspondences between things and "ideas?" (3) How can words become transduced into "ideas" in the "mind" of another person? (4) What is a "mind" in this sense? (5) Going still deeper into the situation, is it true that successions of sound that strike the ear get translated into "ideas" within the brain? (6) Does the brain have any such powers or func-

[1] Chafe, W. L., *Meaning and the Structure of Language*, Chicago: U. Chicago Press, 1970, p. 16.

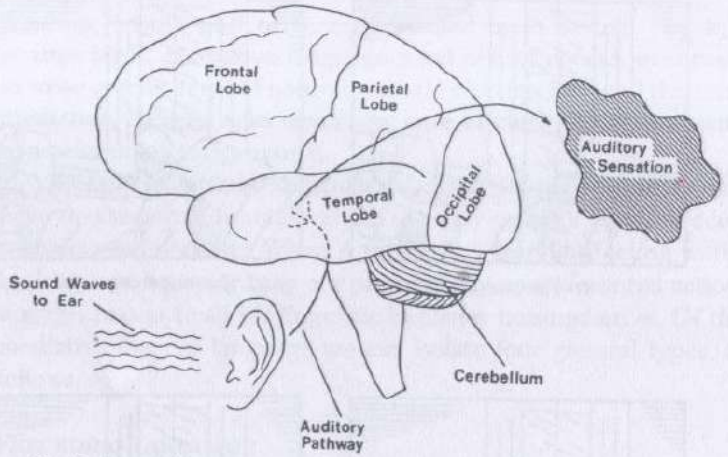


Fig. 7. An excellent example of the futile attempt to associate psychical and physiological processes.

tions? Before we can achieve a natural science description of language we must give satisfactory answers to these questions. The answers are basically to reject all such spookology.

In Chapter III we have already criticized the mentalistic conception of psychology and have formulated the conclusion that every item in the psychological domain consists of an interbehavior of the individual with stimulus objects or persons. This leaves no room for "ideas" that require transmutation. According to the interbehavioral view, ideational behavior, though subtle in operation, are responses of individuals exactly like gross movements. Accordingly, when we assume that there are "ideas" which precede utterances we must think of two kinds of activities. The first, an ideational interbehavior; the second, an utterance interbehavior. Let us not overlook either that utterances themselves can be scaled from the grossest audible articulations down to the inaudible and subvocal forms of behavior.

Probably no writer intends to propose that there is a one-to-one correspondence between words and things, because obviously speech consists of patterns of action, and yet the theory we are discussing must make such an assumption. A similar difficulty arises when we attempt to posit a one-to-one correspondence between

words and "ideas." This is clearly a violent abstractionist procedure. When we give up the mentalistic viewpoint, we can definitely assume that the person's speech behavior consists of complicated interbehavioral patterns operating in connection with things and events on the one hand; and, on the other, persons or other things as auxiliary stimuli.

At the center of the transduction theory there clearly lies the dogma of the brain.[2] It is an unfortunate fact that the brain has been used as a point in the generation of a vicious circle. First, the animistic notion of ideas has been the basis for seizing upon the brain to justify mystical beliefs and later, brain action has been regarded as requiring and legitimizing mentalistic ideas.

I object to the use of the brain for either of these purposes. It is certain that the science of biology in general and the science of neurology in particular do not offer any basis whatsoever for such views. Biology allows us to think of the brain as an immensely important conduction and correlation organ. The brain and the nervous system in general have no other observable properties than to integrate the biological activities of the organism. Of course, since psychological activities are also biological activities—in other words, a psychological response is always the activity of the organism—biological activities participate in psychological action. In this sense, then, psychological actions are also coordinated with nervous tissues and organs. This, however, precludes any idea of a special psychological function of brain action. In the chapter on linguistic reaction systems we shall be seriously concerned with the investigation of these problems.

Despite the adherence of most linguists to the mentalistic tradition I have just outlined, we find that the preoccupation with actual speech situations has forced some students of language to pay some regard to the triphase character of speech events. For example, Gardiner [3] building upon Wegener [4] finds considerable fault with de Saussure's conception on the ground that the latter does not include in his diagram the thing which is spoken of—what

[2] Depicted in Fig. 7.

[3] See Gardiner, A. H., *The Theory of Speech and Language*, Oxford: Clarendon Press 1932.

[4] Wegener, P., *Untersuchunger über die Grundfragen des Sprachlebens*, Halle: Niemeyer, 1885.

Gardiner calls the thing meant. This writer works out a cycle of the following factors in an act of speech.[5]

1. Speaker (James) stimulated by falling rain.
2. Perceiving rain.
3. Thought of walk.
4. Not good for Mary.
5. Desirable to tell Mary.
6. Decision to speak. /then/
7. Choice of word "rain."
8. Articulation of "rain."
9. Mary stimulated by sound "rain."
10. Perception of sound "rain."
11. Identification of word "rain."
12. Verification at window.
13. Realizes James' intention.
14. Follows James' thought train.
15. Says, "What a bore."

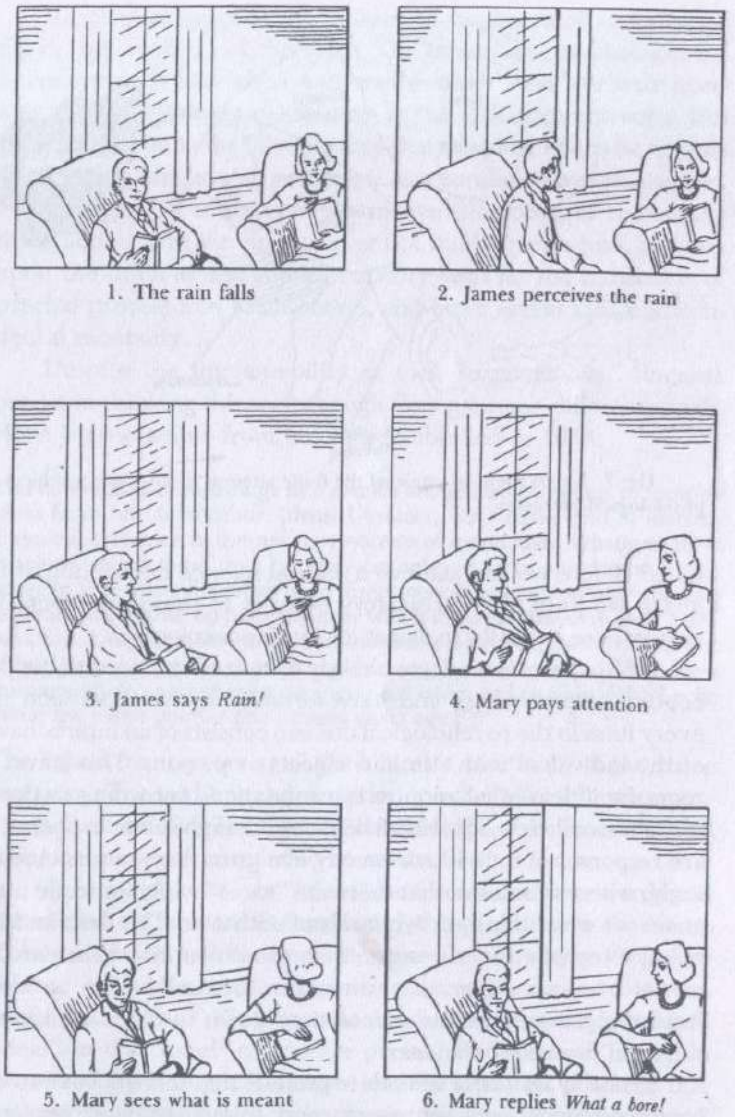
Gardiner's corrections undoubtedly add necessary content to a speech situation. Notice, however, that this emendation is made in terms of a layman's mentalistic description. When we require a scientific analysis of a speech event, we find that Gardiner gets no further than de Saussure. We want to know how a decision to speak becomes an articulation. It is interesting to note that Gardiner's portrayal (Fig. 8) of a referential situation requires no mentalistic description.

MEDIATIVE AND NARRATIONAL LANGUAGE

Referential behavior pervades the entire psychological life of the individual. There is first the great universe of discourse which includes conversation ranging from the most trivial gossip to the discussion of the weightiest problems of politics, art, business, and science. Then there are the events and situations of mutual aid and moral action. Again, there are those important self-communings which operate so effectively in reflection and decision behavior.

Now I may separate off two widely contrasting types of speech on the basis of how closely referential behavior connects with nonreferential behavior. The outstanding case is that in which a referential interbehavior mediates or results in a nonreferential interaction. This occurs, for example, when A says to B, "Please pass the salt." A performs a language reaction facilitating the manipulation of the salt. A more subtle type of mediation is that in which A's language response effects a less obvious movement, such as a seeing

[5] See note 3 preceding page.



1. The rain falls
2. James perceives the rain
3. James says *Rain!*
4. Mary pays attention
5. Mary sees what is meant
6. Mary replies *What a bore!*

Fig. 8. Redrawing of what Gardiner calls "the visible aspects of speech." In addition to the visible aspects he believes there is also a hidden psychic aspect. From Gardiner, A. H., The theory of speech and language, Oxford: Oxford Univ. Press. 1932.

reaction, on the part of B, as illustrated by A saying, "Look, a strange bird." Mediative language need not, of course, eventuate in some specific form of nonreferential behavior. I extend the term mediative, therefore, to cover any case of close connection with non-referential performance.

By contrast with these situations, linguistic performances may have no mediative function at all, but may operate as specific autonomous adjustments. When A says to B, "I am not feeling well," his language behavior may not provoke any nonreferential action. For this reason I call his linguistic behavior nonmediative. Of the mediative form of language we can isolate four general types, as follows.

PRECEDING LANGUAGE

In differentiating between mediative and nonmediative forms I have already illustrated preceding speech. In order to achieve the direct adjustment of securing the salt, A performs a preceding referential response—namely, asking someone to pass the salt. This type of speech occurs most often in the language of request, command, and in general when referential behavior mediates the occurrence of nonlinguistic activity.

ACCOMPANYING LANGUAGE

Many times our direct nonlinguistic interactions are accompanied by language responses which, though they do not in themselves bring about the final adjustment, serve to further or aid it. For instance, the mother may say to her child as they garden together, "You planted that row quite straight," or "It's going very nicely." Her remarks may prove very effective in mediating a more successful adjustment on the part of the child.

FOLLOWING LANGUAGE

The child, on the other hand, as he proceeds with his work, may follow up his particular operations with such remarks as "Doesn't that look fine!" or "Didn't I do well!" This type of linguistic response has, of course, no effect at all upon the nonlinguistic action which is already completed, and is mediative, therefore, only because it is in close relation to the latter.

SUBSTITUTE LANGUAGE

Equally as ineffective so far as direct adjustments are concerned is substitute language. Precisely because the speaker is unable to perform a nonlinguistic final adjustment in certain situations he substitutes a language reference instead. Take the man who sees his blown off hat sailing down the street. He may cry out lustily to someone, "My hat! My hat!"

REFEROR AND REFEREE LANGUAGE

When we observe two persons conversing we cannot overlook the two distinct forms that referential behavior takes on. Normally, we first mark the activity of the speaker as he refers the other person to some object. In so doing his behavior may consist of one or more different kinds of configuration, for example, the utterance of sounds, pointing, or making signs or gestures. The exact configuration is immaterial from a psychological standpoint, other than that in a specific situation it must constitute an adequate adjustment. This form of referential interbehavior I call referor language.

Simultaneous with the action of the speaker is the behavior of the person who is being referred to the object spoken of. In general we may designate the linguistic adjustment of the second person as referee language. To the layman this response may appear more passive than that of the referor, though obviously all psychological performances as occurring events are decidedly active. Naturally referee language comprises all sorts of specific act configurations depending upon the situation in which it operates. In a vocal speech situation the behavior is intimately interrelated with hearing factors. Or when the referee is not in direct contact with the referor, his pattern of behavior may take the form of reading. Here a letter serves as the medium of conversation. Then there are the linguo-gestural interactions in which the referee's responses are primarily visual. Again, the referor merely touches the hand of the referee, thus effecting the linguistic interaction by purely tactual means.[6]

[6] For a more elaborate description of referor and referee language consult the writer's *Principles of Psychology*, Bloomington: Indiana U. Press, 1924–6, Chap. XXIII under the heading of Transmissive and Receptive Speech.

Conversation ordinarily consists of the serial performance of referor and referee behavior by different persons, though not infrequently two or more persons may simultaneously perform both types of acts. When a person speaks to a number of people at once, we have a simple case of referor language together with several or many instances of the referee type.[7]

EXPRESSIVE AND COMMUNICATIVE LANGUAGE

Language interbehavior may also be distinguished as expressive or communicative. The distinction centers about the fact that language behavior need not directly involve another person as an auxiliary stimulus. If we consider ordinary conversational language as typically communicative, we find what A says is not only an adjustment, but also constitutes a stimulus object for B. Not so in the case of expressive language. Here A's performance need not operate beyond his own immediate adjustment. Such is obviously the case when no other person is present. An excellent example is the behavior of Titus Andronicus who continues to plead for his sons though the tribunes have already left the scene to carry out their sentence. Expressive language is also well exemplified when A talks to himself, as when expressing his admiration of a flower, a sunset, or one of his dog's tricks.

The contrast between communicative and expressive interbehavior comes clearly to the surface when we consider the vivid succession of referential adjustments in conversation. Here a constant interstimulational process takes place by the language response of one individual serving as a stimulus for the other person, and so on throughout an elaborate series of linguistic dialogue events.

VARIETIES OF LINGUISTIC SITUATIONS

Linguistic interbehavior is greatly clarified when we analyze various interpersonal situations from the standpoint of whether the stimuli and responses meet the referential criterion. When two

[7] Alternative terms for speaker and hearer are addressor and adressee, speaker and listener.

persons interact linguistically, there may be considerable divergence in the compatibility of their behavior. That is, contrary to the normal situation in which A's referential response constitutes an auxiliary stimulus for B's linguistic behavior, A's referential behavior need not operate in this way. Again, A may perform a nonreferential action which may nevertheless serve to stimulate B to perform a genuinely referential response. There are, then, including the normal, four different possible types of linguistic situations.

(1) What we have called the normal referential situation is copiously illustrated by conversational speech in which each referor response constitutes a stimulus for a referee reaction. The concatenation of stimulus-response actions can be traced to an initial activity on the part of one or the other members of the couple.

(2) Next we have the case in which a referential action of A is not a definitely linguistic action for B. The obvious example is that of A speaking in a language B does not understand. Here B responds to A's behavior as a direct stimulus; he knows A is speaking, but not what he is saying. Since the bistimulational criterion is not met, we expect A's speech not to stimulate a linguistic response from B. Unless, indeed A's unknown speech stimulates B to say something about it. In this instance A's action is an adjustment stimulus for a linguistic response of B. Like any other thing, A's behavior can serve as one of the two bistimulational factors necessary for a referential interaction. The lack of inherent referential interbehavior, however, excludes A's action from being an auxiliary linguistic stimulus.

(3) It may happen that whereas A is not saying anything to B, the latter behaves as if the former were doing so. This is a sort of illusory reference reaction on the part of B. A asks C "Where were you last night?" But B answers instead. Now A was interacting with C as an adjustment stimulus. Accordingly, B's inherently linguistic (audient) response is not interconnected with A's question as an auxiliary stimulus. B's behavior situation we may then conclude comprises a definite referential stimulus action, but not a compatible referential response.[9]

[9] These points are further elucidated in Chap. IX.

(4) In our final situation, A's action is not referential nor is B performing a referential response. A recites a poem in linguistic patterns unfamiliar to B. Despite the verbal configurational character of A's behavior, there are absent the two simultaneously operating stimulus functions required to meet the referential linguistic hypothesis. We may call this speech morphological, but not truly referential. Likewise, B's action, as already indicated above, is direct behavior, but not referential.

Chapter VII

Nonreferential Language: Symbolic Interbehavior

REFERENTIAL VS. NONREFERENTIAL LANGUAGE

An analytic inspection of linguistic phenomena impresses us with the great difference between such activities as speaking or conversing and the behavior of symbolizing things and events or decoding cryptograms. Speaking and conversing are definite instances of referential activity as described in the preceding chapters, while symbolizing performances are of a different sort altogether.[1] So great indeed is the disparity between the two forms of interbehavior that if we call genuine referential behavior "language," interbehavior with symbols should be given another name.

But even if we conform to linguistic usage and retain the term "language" for various kinds of interbehavior—on the principle that names are indifferent as long as we keep distinct the events concerned—we are all the more obligated to keep our phenomena differentiated, since the indiscriminate employment of a term inevitable leads to serious descriptive confusion.

Neither psychologists nor other students of linguistic phenomena have distinguished even between authentic referential interbehavior and sheer verbovocal activity, for instance, echolalia or other forms of verbal gesturing. Yet verbovocal activities frequently consist of nothing more than response configurations prominently involving mouth-head action in socially nonadaptive situations.[2] Because of the long tradition that all linguistic phenomena are symbolic, the term "language" is also employed as the name for all sorts of interbehavior with symbols. So far does this tradition go that mathematics is regarded as exclusively the "language" of

[1] Note that I arbitrarily restrict the term "referential" to the bistimulational type of linguistic event, although in current usage the term is indifferently employed for all types of linguistic facts and often to stress symbolism.

[2] The term "socially adaptive" is employed to distinguish between a general modification of an individual's condition (whether for better or worse) through psychological activity, and the psychologically technical event comprising the coordinated operation of a response function of an organism with a stimulus function of an object, which event I call a psychological adjustment.

science, and science itself is said to be merely a "language." Not only do we have here a grouping of complex behavior such as observations, manipulations, and experimentations with linguistic interbehavior, but also a grouping with things, so that even complex civilizational equipments are confused with linguistic activities.

As a student of a particular type of interbehavior, the psychologist must not only distinguish between actions and things, but likewise mark off from each other various types of linguistic interbehavior. I propose, therefore, to characterize activities such as mere vocal soundmaking, vocal gesturing (echolalia), singing, and manual record-making (whether words, signs, or symbolic forms) as nonreferential in order to differentiate them from bistimulational interbehavior. In the present chapter we consider the symbolic form of linguistic interbehavior, reserving for later treatment other forms of nonreferential language.

SIMPLE AND COMPLEX SYMBOLIC INTERBEHAVIOR

Probably the best way to sum up the primary characteristics of symbolic behavior is to consider the unique way in which the stimulus and response functions operate in symbolic behavior segments.

SIMPLE SYMBOLIC BEHAVIOR SEGMENTS

In simple symbolic behavior the reactor is interbehaving *with* a symbolic situation taken as a whole. While responding to the identities $2+2=4$ or $\sqrt{4}=2$ he interacts in each case with an inseverable couple. Though numerically two, both things constitute a single stimulus object, inasmuch as only one stimulus function inheres in the couple. The two or more objects in any complex symbolic situation are interacted with in the same way as one interbehaves with a crowd of persons or a heap of sand. Such interactions are in principle exactly like the direct responses discussed in the previous chapter. The simple symbolic behavior segment is therefore not a unique form of psychological interbehavior, since we cannot justifiably differentiate behavior classes on the basis of the type of object with which the reactor interbehaves. The typical symbolic behavior segment involves a substitute function. (See Fig. 9.)

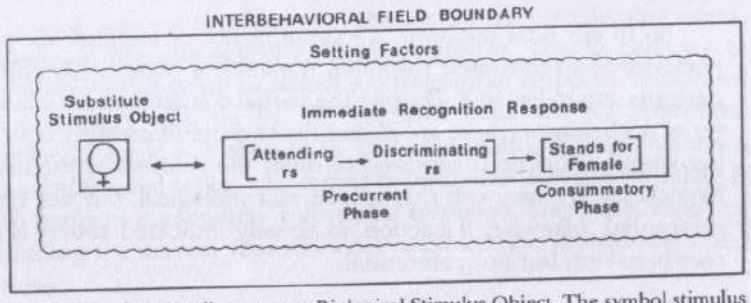


Fig. 9. Simple adjustment to Biological Stimulus Object. The symbol stimulus object is similar to a sign stimulus object, aside from the detailed variation in the total interbehavioral situation.

COMPLEX SYMBOLIC BEHAVIOR SEGMENTS

When a person interacts *within* a symbolic situation, there are two distinct objects interacted with in turn, each with its own stimulus function. The first of the two operates as a substitute stimulus for the adjustment stimulus of the completed interaction. For example, X comes across the symbols, $\sqrt{4}$, π, or \$, and immediately interacts with what these symbol objects stand for—namely, 2, 3.1414, and dollar, respectively. Similarly, the words "notice" or "warning" constitute substitute stimuli for other verbally presented matter, as is true when one can only see boldly printed or written headings. Comparable symbolic behavior occurs when some mark or symbol points toward some condition or circumstance to be avoided. The examples given are typical of a large number of symbolic interactions, since in each case the underlying reciprocal operation of stimulus objects and response configurations is in principle alike.

Because all psychological interbehavior involves specific reactions, it is impossible to say what their particular behavior configurations will be like or what specific stimulus functions any particular object will have. Different persons interbehave differently with the same objects, while the same objects may have many different stimulus functions for the same individual. It is only in restricted situations, when we know the person and the setting or field in which he is interacting, that we can be confident concerning the operation of the specific response and stimulus functions. In general, what words, signs, or other symbolic stimulus objects mean

must be discovered by observing how they function in specific behavior segments. In general the limits of such interactions depend upon the individual's reactional biography and the immediate settings, which include the context or relationship of the stimulus objects to other objects.

Interbehavior within symbolic situations may, of course, be complicated by a series of substitutions, for example, in the equation $S = gt^2/2$, $gt^2/2$ substitutes for a free falling body, S, while S in turn is a symbol for the distance covered by the falling body. When we wish to know or to interact with the actual distance we have to find out the precise value of *t*. With each successive evaluation of *t* we have a new symbolic system.

The accompanying diagram, Fig. 10, illustrates symbol interaction. The first or substitute stimulus object (SS) points directly to the precurrent phase of a response. This precurrent phase consists of two reaction systems in succession—namely, an attentional act and a perceptual discrimination. When the individual discriminates the substitute object as a symbol, the consummatory or end phase of the behavior segment consists of an awareness reaction system interrelated with and directing the adjustment stimulus object (S_j). Naturally, the organization of the entire behavior segment represents an event whose antecedents are located in the previous interbehavior of the individual with such objects at the time they became coupled.

It is probable that all complex symbolic situations really comprise both types of symbolic interactions mentioned—namely, the response *to* (interbehavior with) and the response *within* a symbolic situation. For example, in the symbolism representing the freely falling body, t and square, g and ½ are fixed members of inseverable couples. Moreover, in this and certainly in other complex symbolic situations we can isolate triads and even higher groupings of symbolic things, so that we not only interact with a dyadic or triadic relationship, but also with sets of objects within a series or order.

Symbolic behavior constitutes a special case of implicit or substitute stimulus behavior, though, of course, not all substitute behavior is symbolic. Only when there is an intimate coupling of two stimulus objects does symbolic interbehavior occur. In nonsymbolic instances of substitute behavior the substitute stimulus object

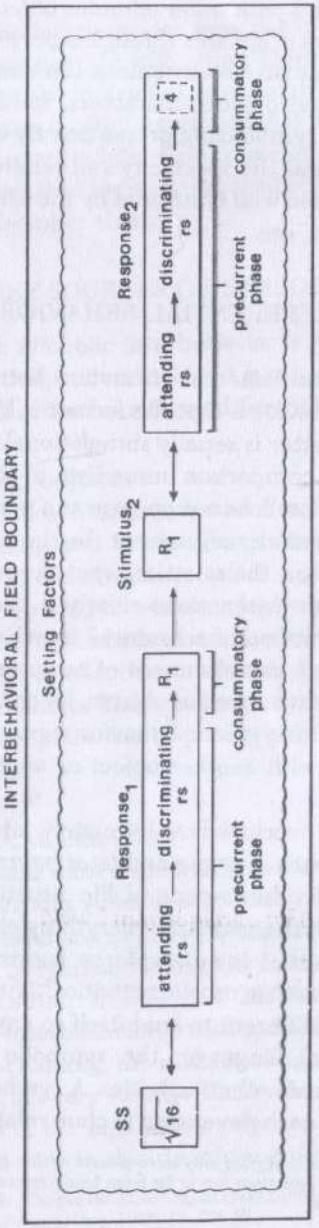


Fig. 10. Diagram based on serial symbolic situation.
SS = Substitute Stimulus Object rs = Reaction System
In unusual situations problems may arise as to how the symbolic object was coded and how best to decode it: in other words, questions may arise whether or not an object is a symbol and what it stands for. It is an interesting circumstance that what to some reactors is a definite referential message may be to others only problematic symbolism, for example, uninterpreted symbols or even just signs.

is less closely connected with other stimulus objects. This connectivity, of course, always originates through a person's concrete adjustments in specific human circumstances. It is under these specific behavior conditions that objects, characters, words, and signs, acquire their essentially symbolizing properties. By essential symbolizing properties is meant the specificity and relative inseverability of connection which is so well illustrated by the symbolic character of numbers—1, 2, 3, n, etc.

SYMBOLIC AND REFERENTIAL BEHAVIOR COMPARED

Technically the fundamental distinction between referential and symbolic interbehavior is that the former is bistimulational in character, while the latter is serially stimulational.[3] Referential interbehavior is thus by comparison immediate in the sense that the referor stimulus function does not operate as a pointer or sign, but as a factor in an immediate adjustment. In the case of authentic referential interbehavior, the question what the referor's stimulus action stands for never arises, since clearly it does not stand for anything. The phenomenon of referential interbehavior does not exist until the thorough establishment of an interrelationship between the act and the two stimulus objects. By contrast, an object's stimulus functions in the symbolic behavior segment lead to a later orientational contact with another object or another property of the same object.

It is impossible to overlook how intimately integrated referential interbehavior is, both in origin and later operation, with other behavior and the individual's general life situations. Referential behavior is of a piece with practically everything else the individual does. Let us recall that it is only referee language that can be brought into relation with symbolic activities. The referor form of language is much too different to lend itself to any comparison. In contrast to referential language, the symbolic form is as far removed as possible from other activities. A symbol and its couple are specialized things, each developed in close relationship with the

[3] This comparison naturally applies only to responses *within* symbolic situations. Responses *to* symbolic stimuli or situations are so far from being referential as not to require me to point out the variations.

other, and removed from other things. The response to symbol objects are likewise specialized and separated from other activities. Of course, in everyday life some symbols are somewhat ambiguous, but this fact detracts in a way from their functionality. The character σ of the Greek alphabet even among scientists is made to stand for standard deviation and milisecond, but never in such a way as to occasion the slightest confusion. We may add that it is only in such situations that stimuli require context. When we consider that symbolic stimuli are mostly things, whereas linguistic referee stimuli are usually actions, the great gulf between referential and symbolic behavior segments is apparent.

Not only are symbolic stimuli successive and serial, but they may also be transitive in relation. Either one of the two terms of a symbol couple stands for the other with equal facility. Stimuli in referential interbehavior, of course, likewise show a tremendous facility in their joint operations, but we shall look far to find an object or situation serving as a substitute stimulus for a response to a referor utterance, no matter how frequently we hear persons speak of such objects. It is true that we may predict Johnny's mother speaking to him about the tear he has just made in his trousers, but that means that for us bystanders a boy's trousers may be a symbol for a mother's referential behavior. The torn trousers, however, as an adjustment stimulus, even if we think of it as isolated from its joint connection with Johnny as an auxiliary stimulus, is certainly not for the mother an authentic symbol.

Another contrast between referential and symbolic interbehavior is the serial character of symbol stimuli. Referential events constitute immediately closed systems. The reference made in conjunction with an auxiliary and an adjustment stimulus is complete and the three factors summarize the whole. Not so in some cases of symbols. As we have seen, there are innumerable symbolic situations in which symbol objects are related in chains, so that we have triadic, tetradic, and even more complex relations.

Next we consider the striking difference between referential and symbolic events on the basis of the three factors in each interbehavioral field. Whereas in symbolic situations the substitute stimulus object is especially prominent, since upon its character depends the reactor's contact with the thing substituted for, this

is not the case in referential behavior fields. By contrast, in referential interbehavior the auxiliary stimulus which would most likely be compared with the symbol, though indispensable, can appear as an indifferent factor, since there is very little restriction on what is said from the standpoint of being referred to the referent. Any number of types of utterance serve to acquaint us with what is spoken of. This is, of course, owing to the integrative organization of speech, objects referred to, and persons spoken to. As contrasted with symbol situations, the referent appears more outstanding than the reference. The reference, as we know in some situations, may be only partially present, even to a vanishing point in the most intimate circumstances. Everyone has noticed the frequency with which we anticipate what the speaker is about to say.

When we seek a norm for referential behavior we do well to turn to an unambiguous situation such as the "intercommunication" of unlettered speakers. In less complicated civilizations we probably find the best examples of genuine referential interbehavior, since in such situations referential conduct is easier viewed as an actual adjustment rather than formalized action. Thus we can isolate referential interbehavior from the great mass of other activities, and learn how speakers refer to things just as we learn how they perceive, remember, etc. Moreover, the absence of writing and reading in such situations makes it possible to avoid the hypostatization of acts into sounds, words, and sentences. It is commonly known that the influence of written materials often results in the confusion of actions with the descriptions of those actions. We may well expect that among primitive speakers much of the linguistic behavior is performed as elementary adjustments in the presence of the referent objects.

But even if we observe the symbolic situations which most resemble referential language we cannot overlook the differences. Mathematicians and others who use certain symbols frequently develop a tremendous facility in handling them. But this facility bred of familiarity, which is the case with most psychological performances, does not blind us to the fact that this is an ease of manipulation rather than a case of being thoroughly integrated with the situations in question. It is significant to notice that referential interbehavior is never laborious and difficult to build up,

while symbolic interbehavior may not only be acquired with difficulty, but may operate with effort. During the evolution of referential behavior the individual unwittingly builds up performances, thus the opinion is often expressed that children intuitively learn foreign languages,[4] while their missionary parents who approach other languages than their own as symbolic materials must use their children to decipher them.

THREE SOURCES OF SYMBOLIC BEHAVIOR

Although symbolic interbehavior is a specialized form of psychological activity, nevertheless it is not an unfounded speculation to derive such action from three different kinds of behavior sources.

MANIPULATING OBJECTS

The first, most elementary and direct, is probable such actions of stick-notching and crude record making as a primitive man might make to enable him to tell at a glance whether any of his animals have strayed or whether his boundaries are intact. Essentially such activity consists of manipulating simple objects, so that they will serve as effective substitutes for other things in definite and useful situations. This source need not occupy us further, as its description is a plain tale requiring only elementary observations for the telling.

FIXATING VOCAL BEHAVIOR

The second source involving verbal and graphic behavior is more complex and yields many more varieties of symbols as well as more powerful and effective symbol interbehavior. The potency of this form of symbol-making lies in the fact that the individual contrives substitute stimuli and thus can elaborate and complete his symbolic interbehavior. From such contriving stems the evolution of verbal naming, the making of signs, characters, and linguistic recording of every variety. This evolution involves a fixation and an extension of the organism's response configurations.

The first step in this development occurs when the speaker

[4] Tomb, J. W., On the Intuitive Capacity of Children to Understand Spoken Language, *British Journal of Psychology*, 1925, 16, 53–55.

makes his behavior stand out as something more than simple enunciation. In consequence it takes on a certain degree of autonomy. In this process his own act, originally performed as a deliberate gesture, stimulates him to respond to it as an instrument for achieving some purpose. In the case of a name symbol the person performs a simple verbovocal act in the presence of a particular object or circumstance. This act may be a simple imitation of a sound or a reference to a color, motion or other characteristic of a stimulating object. It is indifferent whether this is deliberate imitation or analysis of a quality, or whether the verbovocal act is elicited as an affective response; the result is the same. When the behavior configuration is recognized as so interconnected with the thing named as to be substitutable for it, it takes on symbolic character.

A second step consists of crystalizing vocal action by writing down some representation of it. A list of names of things illustrates this step. Such graphic recording correlates with and perhaps follows upon the pictorial representation of the stimulus object. Later the names of things get substituted for by marks, characters, signs, or words.

FIXATING REFERENTIAL RESPONSES

Because referential responses are to a great extent also vocal behavior, even elaborate action can become a basis for symbols. For example, a speaker tells someone that a certain article must be read and from this certain things or actions become symbols for *must* behavior. As we shall see later, the speech behavior itself can, of course, become a symbol. When referential behavior becomes fully developed as a symbol it comprises a mode of adjustment very different from the original referential activity, in that it is now a direct response to a single stimulus rather than an indirect response to one of two stimuli.

WHY SYMBOLIC AND REFERENTIAL LANGUAGE ARE CONFUSED

A basic influence upon the erroneous identification of symbolic and referential interbehavior is undoubtedly the widespread attitude that interpersonal speech or conversation involves word-

things. Speakers are believed to utter vocal symbols which for the hearer stand for the things spoken of. Thus the conception of the word-symbol is responsible both for the confusion of symbolic with referential interbehavior and linguistic action with linguistic things. Not only written or printed words are regarded as referential phenomena, but mathematical and other symbols also.

Those who are interested in the influence of general culture upon scientific thinking will find a good illustration in the way the literary character of our civilization induces scholars quite illegitimately to transform behavioral adjustments into reified words. Even when dissenting voices are heard, they speak in the interest of metaphysics instead of the actual occurrence of phenomena. For example, when Croce (1866–1952) says that speech is perpetual creation activity, he is not so much informing us of the concrete behavior of persons as exemplifying his idea of spiritual expression.

Both the subtleness and immediacy of referential language argue against reference behavior serving as symbols. The extreme case is speaking to oneself, when obviously no symbols are necessary. But even when the referee is another person, it is clear that speakers do not ordinarily know what they are to say. Certainly in such spontaneous situations they do not set forth words. The rule-proving exceptions are those fairly unusual cases in which individuals hesitate in speaking in order to "search for the right word." Such situations presuppose that the speaker's vocabulary is ample enough for choosing.

Nor can the fact that one's speech is appropriate to particular settings, as when one speaks deferentially or solicitously, be interpreted as the production of certain word-symbols. Not even our most fitting or effective speech is so stereotyped as to warrant the conclusion that speaking consists of the production of particular patterns of sounds or words. So far as the constancy of sound is concerned, phoneticians are fully satisfied that we do not even repeat sounds exactly when the attempt is made under laboratory conditions.

Doubtless the chief obstacle to believing that referential language consists of word symbols is the great difficulty of discovering these units. An objective psychological study of grammar discloses that the whole notion of words must disappear from our description

of actual speech behavior.[5] It is apparent that what in one case is described as a one-word reaction must be regarded as many words in another language. Psychological and linguistic studies demonstrate that speakers do not really know how many words they utter in a speech situation. In general, speakers differentiate word units only when they definitely attempt to discriminate between the things spoken of, as in enumerating persons, objects, situations, and circumstances. Note, however, that referor language, when enumerative, tends toward some form of purely verbal behavior. Even enumerating speech involves words to a greater extent when things rather than events are spoken of, though here the activity approaches naming behavior. In every case, however, we must take account of the weight of prepositions and conjunctions which speech patterns always carry, as well as the perennial syncopations and elisions ("frinstance," "atall," "wilya," etc.). By all means it must be admitted that even the studied ability to differentiate word units or to tell how many there are in a conversational activity, even in a simple remark, depends upon how accustomed one is to reading or writing. Incidentally, we cannot accurately assert that writing is transcribed speech, though that condition is approximated in an almost illiterate person.

The use of words to mask the distinction between referential and symbolic language probably is stressed more in connection with referee than with referor speech. It is usually held that the words uttered by the referor constitute symbols for the referee—symbols standing for the referents. But even here an illegitimate identification is made between auxiliary stimulus objects and symbols. Even if we overlook the great difference between the actual behavior of a referor and a symbol-thing, it is impossible to set aside the distinction between technical symbol stimuli and mere substitute stimuli.

Certainly in the case of a complex symbol the reactor must be keenly alive to its form. We know, however, that referential speech operates very effectively when from the standpoint of words it is syncopated, slurred over, and distorted. The referee need not even be in contact with much of what the speaker says in order to be referred to the referent. Significant here also is the fact that the

[5] See Kantor, J. R., *An Objective Psychology of Grammar*, Bloomington: Indiana U. Science Series, 1936.

referor's many different kinds of activity, such as gestures of all types, constitute effective stimuli for referee behavior. At least we may say that in referential language there is a tremendous leeway provided by the setting, which is not the case, in the same degree at any rate, in the symbolic situation.

The confusion between referential and symbolic behavior is likewise fostered by the physiological tradition that leads us to stress general gross action, such as the sound-making of the mouth, throat, and chest, or the mark-making actions of the hand. Specifically, the result is that we overstress specialized actions that can be hypostatized into things and thus play into the hand of the symbolic current of thought. In the meantime we overlook the actual complexities and differences between particular behavior segments, leaving out of consideration all sorts of gestures and other subtle forms of interpersonal behavior. On the whole we fail to note that referential interbehavior is primarily a unique form of activity contrasting sharply in its characteristic form from symbolic language.

A third factor leading to the confusion of referential and symbolic interbehavior is that in many complicated performances both types of behavior are involved. The fact that our complicated adaptations are analyzable into many sorts of specific behavior segments is no reason why we should ignore the fundamental character of any particular component of the total complex.

As a final suggestion for the failure to keep different phenomena distinct we refer to the laxity in respecting the difference between descriptions and the phenomena described. In describing anything we inevitably use verbal terms. In other than linguistic description it is readily admitted that there is only a functionally useful correspondence between the description and the thing described. The fixity of description in no wise implies a fixity of events. Not the same precautions, apparently, are observed in the case of linguistic phenomena, though likewise here word descriptions are not at all indicative of word events.

THREE WAYS OF ORGANIZING SYMBOLIC CONNECTIONS

The determinate coordination of several stimulus objects with particular response configurations, really stimulus and response functions, so that one object can substitute for the other, naturally

occurs under various auspices. A consideration of some of the different ways in which symbolic interbehavior originates indicates varying levels of operation as well as contrasting motivation. For convenience I examine three unique types of symbolic organization which I arbitrarily name (a) fortuitous, (b) deliberate, and (c) rationalized.

(a) Illustrative of the fortuitous signifier—significant relationship are those everyday situations in which some natural object or event is taken to stand for some other natural object or condition. The east wind is made into a sign of rain, an eclipse of the sun a portent of impending disaster. Such contrivances may follow the general principle of social psychology according to which a connection set up by an individual later becomes a widespread social item. Or, the particular form of symbolic interbehavior may be purely idiosyncratic.[6] On this level the connections are frequently organized in complete disregard of natural conditions.

The haphazardness of the present form of symbolization applies only to the connection of stimulus objects. Fortuitous symbolization usually has a definite basis in the beliefs, desires, knowledge, and other features of the individual's behavior equipment achieved through his particular reactional biography. Likewise numerous economic, social, and political phenomena play their part in the origin and development of symbolic interbehavior.

Words of all sorts serve as symbols on this level. Especially important here are the symbols with definite significants. Inquire for instance what the symbols democracy, virtue, highest good, or national honor mean. Many individuals who regard the significants which these words stand for as not only strikingly real, but worth fighting for, are still unable exactly to tell what they are. Such forms of fortuitous symbol behavior suggest many ramifications of cultural history in which names, terms, slogans, etc., operate in man's adaptation to his complex environments. The reader is cautioned, however, not to confuse these psychological phenomena of indefinite symbolization with those circumstances in which words and slogans carry direct stimulus functions for affective and other immediate responses. We refer here, of course, to the stimulus functions of

[6] Cf., Kantor, J. R., *An Outline of Social Psychology*, Chicago: Follett, 1929.

words in poetry, in devotional texts, and to the general phenomena of word magic.

(b) When substitute stimulus objects are themselves constructions they point to definite criteria for the deliberate establishment of symbolic interbehavior. Pronounced among the symbols deliberately developed are all those of historico-traditional significance, the alphabetical characters placed for sounds, numerical characters for numbers, and notes for musical sounds or scale position.

Within the series of deliberate symbol coordinations there are some that appear more fitting or more effective than others. For example, number characters are more arbitrary than letters as substitute stimuli or signifiers, even though the latter as historical developments of a particular alphabet are also contrived. Scientific symbols are probably better integrated with their significants than both the two other types of stimulus coordination discussed.

The simplest type of scientific symbolization is perhaps chemical notation. One might regard such characters as O, Fe, Bi, Cr, etc., as merely analogous to musical note signifiers, though there is always an important background of system and organization. When we go from atomic to molecular and still farther to chemical reaction symbolism, we arrive at a set of substitute stimuli that are presumably carefully and precisely correlated with chemical reactions and other complex events.

A notable feature of scientific symbolization is exemplified by the terms "vitamin a, b, c, d," etc. The problem was originally to provide names for unknown substances which exerted definite effects upon organisms. Scientists argue that once the isolation and scientific acquaintances are made, the substances involved should be symbolized by definite chemical formulae. For example, Moldavan objects to the maintenance of "such widely different chemical substances as carotenes, ascorbic acid, irradiated sterols, pyrimidine—thiazole compounds, sodium phosphate, manganese compounds, etc., under the same heading." [7] He adds, "Anti-neuritic, anti-scorbutic, anti-rachitic, anti-anemic, anti-goitric, etc., substances should be classified with the chemical family to which they belong or grouped with the natural or pharmaceutical substances which have closely related physiological properties."

[7] Moldavan, A., Vitamins? *Science*, 1935, 81, p. 639.

The problem of scientific symbolization is sharply focused when it gets complicated with the question of priority of discovery and an uncertainty of what is to be symbolized. The isolation of a new active principle of ergot privides such a problem. Is there an identical substance which different workers have isolated and if so should it be named or symbolized as ergostetrine, ergometrine, or ergoticin? [8] We are reminded in this connection of the frequently arising question whether there is a substance, event, or condition (magnetic force, ether, phlogiston, instinct) for which symbols are available.

(c) When a symbol or set of symbols is superimposed upon a situation by way of explaining or otherwise intellectually assimilating it we have the *rationalistic* type of symbol organization. Thus the practice of communion is declared to be a symbol of the communicant's appreciation of his relationship to some higher being. The objects employed in the rite apparently constitute substitute stimulation for reactions to the relationship.

A generally familiar instance of this type of symbol organization is the Freudian imposition of a signifier-significant contrivance upon so-called dream contents. Starting with a well-rounded dogmatic conception of man's nature and activities, the psychoanalyst manages to discover all sorts of possibilities for making the objects and events of dream life into symbols for sexual and other wish-fulfilling circumstances.

RANGE OF SIGNIFYING STIMULUS OBJECTS

In view of the large place that symbolic interbehavior occupies in human life it is not surprising that symbols and responses to them cover a wide range. Both the number and variety of symbols are suggested by considering the symbolic scales, beginning with the simple act of notching a stick to record the number of sheep in a fold and ending with such notations as,

$$E_1 = \frac{-2\pi m z^2 e^4}{h^2 n_1^2}, \qquad R = \frac{2m\pi^2 e^4 z^2}{ch^3}, \qquad T = \frac{1}{2}\left(\frac{1}{m_1} + \frac{1}{m_2}\right)p^2,$$

employed by physicists. The latter reached to the outermost limits of complicated scientific thought and experimental operations.

[8] See Thompson, M. R., The New Active Principle of Ergot, *Science*, 1935, 86, 636–639.

How frequently one performs symbolic behavior, and conversely the number and types of symbols with which one interbehaves, are conditioned by the complexity of one's civilization. A highly complicated society, with its large number of objects capable of serving as intricately organized substitute stimuli, provides a multiplicity of occasions for performing symbolic behavior. There is hardly a complex human event that excludes a compact conjunction of response configurations with adjustment and symbol substitute stimuli. Almost every object or condition can be the locus of symbolic stimulus functions. Upon the particular life conditions of an individual naturally depends the question whether he approaches the upper boundary provided by a complex society. Probably the most intricate and profuse symbolic behavior is performed by the mathematical logician who works with symbols for abstract relations and with symbols for symbols of such relations. The enumeration of some classes of symbolic stimuli indicates the variety and extent of symbolic interbehavior.

TYPES OF SYMBOLIC COUPLES

EXISTENT-EXISTENT SYMBOLS

In this class I place all objects, events, and actions in which inhere stimulus functions coordinated with existent objects and events of every variety. Included among the objects are all sorts of qualities, for example, sounds (as of program music), odors, colors, etc. The actions comprise manual, facial, vocal, and postural, gestures.

EXISTENT-NONEXISTENT SYMBOLS

In addition to the things suggested in the preceding class I place here the various movements and postures of dancers and actors in Oriental dramas, pageants, and religious or other ceremonials on the basis that they stimulate interaction with phenomena that have no substantive existence.

REPRESENTANT-EXISTENT SYMBOLS

The principle of this class of symbolic phenomena is that the substitute objects are representations of existing things. These in-

clude not only pictures and statues, but also such suggestive lines as the cartoonist uses to stand for persons.

REPRESENTANT NONEXISTENT SYMBOLS

This class of symbol phenomena reminds us of the degrees of non-existence in represented things. When symbolized things are constructions instead of naturally existing things, they are more or less extensive. Scientific models of every variety constitute symbols for things partially natural and partially constructed. Somewhat more abstract types of representational objects are various geometric figures (triangles, quadrilaterals, and the more complex constructions) having space or mathematical relations as their significants.

SIGN-SIGNIFICANT SYMBOLS

In another group are placed contrived objects that are obviously not representative of their significants, such as stars, swastikas, heraldic emblems, signs of the zodiac or drawings (Horus weighing the souls of the dead). In many cases these symbols are deliberately and arbitrarily made to stand for something which has no existence. A more technical form of symbol in this class consists of all sorts of marks and characters such as number signs and formulae standing for quantities, magnitudes, and operations.

INDICATOR-DENOTANT

In a literate society nothing surpasses the alphabet and its compounds as symbolic substitute stimuli. Letters and especially the putative sounds, syllables, and words of speech are made to do duty as substitute stimuli for responses to every variety of thing and event. Aside from single letters, combinations of alphabetic units are employed, first as abbreviations of words which later become independent symbols (O.K., Q. E. D., E. & O. E.,) for objects and conditions. Words, of course, are widely employed in spoken, carved (inscriptions), written, or printed form to signify every variety of concrete fact or abstract material. Written and printed records consist of combinations of words serving as complex symbols. Another symbolic word item is the arrangment of words in patterns, for example, the distribution of type on a page by the ultra-modern poet to represent events.

A special place must be assigned to sentences or propositions whether in the form of words or other symbols. "Turn to the right" illustrates one of the simpler symbol-sentence forms. Among the more elaborate types are found stimulational functions for responses of carrying out certain manipulational and operational directions, such as the elaborate behavior of a mathematical or symbolic-logical sort.

RANGES OF BEHAVIOR AND RELATIONS

An ingenious classification of symbols has been presented by the eminent logician C. S. Peirce.[9] He starts with signs or representaments which he defines as "something which stands to somebody for something in some respect or capacity." These signs he divides into three classes: icons, indices and symbols. Icons are things which by their very nature suggest something, as a picture of a hat represents a hat. Indices are objects which indicate something else, for example, the rolling gait of a man indicates that he is a sailor. Symbols are things which through habit are connected with other things, as the word "man" is made to stand for a man.

Peirce's classification clearly stresses the various forms of symbolic relationship. A psychological classification by comparison bases itself upon the different sorts of symbolic interbehavior. From the standpoint of psychological interbehavior any classification offered can only illustrate the range of such interbehavior and not its complete and comprehensive organization.

NOETIC AND OPERATIONAL SYMBOLISM

Like all psychological events, the essentially symbolic form of response and stimulus function operates in different sorts of situations. It is convenient to mark off the symbol behavior segments found in noetic and in operational situations.

NOETIC SYMBOLISM

Here the essential fact is that the substitute stimulus function of the letter "a" operates to elicit a response to a noetic function

[9] *Collected Papers of Charles Sanders Peirce*, Cambridge: Harvard U. Press, 1932, Vol. II, p. 156–173.

"b." The response function can be called an awareness, knowing, appreciating, or understanding act with respect to b. Examples are the stimulus functions of the letter "a" indicating or signifying the sound "a," and the letters "ok" stimulating one to know that the box so marked is satisfactory. Similarly, N.Y., Nov. 4, '36, 8 P.M., symbolize city, month, day and clock time, while a graph informs one of the changes in car loadings, modifications of price index, elimination rate of learning errors or reduction of performance time.

OPERATIONAL SYMBOLISM

In a class by themselves stand the symbolic behavior situations which include effective action systems. The substitute stimulus functions in this case are correlates of reaction systems not only leading to an orientation interaction with a stimulus object, but also to a further response constituting an operation of a particular sort. When we interact with various symbols of mathematical operation—for example, the simple +, —, X, ÷, and the more complex $\Sigma\ dx/dy$, we first identify the symbol as an operation and then proceed to the operation. In the second interaction with the stimulus object the response function is correlated with a different stimulus function from the first one. In the latter case the function is a direct one and the object operates as a signal for a particular sort of performance. Mathematical operations are typical, but obviously only one of the many kinds of operations found in symbolic situations. All sorts of manipulations and effective performances can be substituted for by symbolic stimuli.

It is hardly necessary to add that the term "operation" is used in a specific sense. Since all psychological phenomena constitute operations, the particular performances involved in symbol situations consist of very definite activities integrated with objects in given situations. While in any symbolic situation either the noetic or operation form of reaction may be stressed, in many cases both types may be equally prominent. An illustrative instance is that in which one is required to decipher a symbol or ascertain its meaning before one can proceed to carry out the operation it indicates. The first step consists of the appreciation that this stimulus object is a symbol standing for something, but what that something is is vague or unknown.

On the basis of his experience with such stimulus objects and symbol situations the reactor may even be stimulated to question the propriety of putting such a symbol for the adjustment stimulus object. Thus the simplicity and facility of symbolic behavior depend upon the frequency of the person's contact with the associated couple or upon the fact that the general circumstances are such as to make the various involved relationships appear inevitable. Unless the reactor can decode the symbol there can be no operational behavior of the sort indicated. But when the decoding is successively carried out, the symbolic behavior can eventuate in the operational form of response.

REFERENTIAL AND SYMBOLIC BEHAVIOR IN THE SAME SITUATION

Important for the understanding of both symbolic and referential interbehavior are the numerous situations in which both types of behavior segments occur together. Quite frequently an individual in the midst of a vivacious conversation gesticulates (pounds on the table, brings his right fist violently into the palm of his left hand, points upward) by way of symbolizing some action or situation, the while he discusses some problem or informs the referee concerning a matter of mutual interest. Observe the subtleness and smoothness of the referential action as compared with the relatively cruder operation of the symbolic acitivity. The latter serves definitely as a substitute stimulus for an adjustment stimulus object on the part of the second person or referee.

Let us analyze for a moment the performance of the referor. Discoursing upon some topic with fluent verbovocal, manual or other gesture responses as stimulated by the referents and referee, he is also bringing to the referee's attention the location of a place on a map, illustrating an object by a diagram or an event by setting up an equation. In the last three instances the reactor is providing substitute stimuli for his referee in order to bring about his response to an adjustment stimulus object. Naturally both the reactor's symbolic and referential behavior must be differentiated from pantomimetic, stance, and other responses also occupying a place in the total situation.

Turn now to a study of the referee in order further to distin-

guish between symbolic and referential behavior. We frequently find that the second person responds more effectively to one or the other of the two kinds of phenomena. Though B may be unable to understand A's conversation, he can be stimulated by the substitute stimulus A sets up to respond to the adjustment stimulus.

Probably the best exemplification of situations in which referential and symbolic interbehaviors are intermixed are those interpersonal events in which neither person understands the conventional language of the other. Inevitably great limitations are placed upon their lingustic intercourse, though it is not altogether excluded, since no matter how far apart the persons may be in their dialectal behavior there is still a common ground of informal gestural speech. Here the behavior is very crude and can only proceed in the immediate presence of the referents, but it is genuine referential behavior nevertheless. Whatever symbolic interbehavior is found in such situations is, of course, performed independently by each individual. There has been no occasion for the two persons to have acquired common significance for any particular thing. This assumes, of course, that by symbolic behavior we understand those actions involving formal connections between substitute and adjustment stimuli. Should we draw no line between one kind of substitute stimulation and another, we are never certain that we have symbolic activities in any situation.

Likewise throughout this discussion we are confining ourselves to specific behavior segments, for otherwise we could make no distinctions at all. For example, merely because A obtains something through the agency of B we cannot say whether referential or symbolic behavior has been demonstrated. In order to determine the occurrence of symbolic referential or any other sort of interbehavior the specific response and stimulus functions must be rigidly isolated and analytically described.

SYMBOLISM BECOMES REFERENTIAL AND *VICE VERSA*

When X begins his first Russian lesson, the novel words printed in an unknown alphabet can only symbolize for him a series of language things and actions. Possibly considerable progress is required for the words to substitute for Greek texts he has seen. Later

the printed materials take on substitute functions for complex sounds pronounced more or less in the Slavic manner, while still later such evoked words may themselves become symbols for objects. An intervening stage consists of the enunciated words standing for speech activities. Not until the diligent student builds up habits which constitute definite response configurations in intimate connection with spoken-of things and a spoken-to person (self or other) do we have a genuine advance from symbolic to referential behavior. Such a hypothetical evolution of symbolic to referential behavior can of course proceed in all sorts of ways. For example, the order of the steps may be transposed or a number of them may be skipped over altogether.

Referential behavior can also become symbolic. The process consists of isolating and fixing a bona fide referential activity. The means of carrying out this process vary. One way is to write down a set of words pictured as issuing from the mouth of a speaker as he is adjusting himself to a particular situation. It is optional with the person carrying out the process to include as little or as much of the total linguistic situation as he likes. He may draw a head with the drawn words streaming from the mouth or he may include the two persons in the dialogue carrying out their speech as part of a larger set of activities represented by a number of pictures. Obviously the carrying out of such a process depends upon all the cumulative events involved in an individual's learning to write or represent speaking, and the evolution of literacy which provides words for the symbolization purpose.

A more elaborate and roundabout variant of the isolating and fixing process occurs when authentic speech behavior constitutes a substitute stimulus for some other object. Is it not true that children who say "I wish I had a piece of that candy" realize in some sense that their reference to their own wish will be taken as a symbol for their asking for the desired object? While such behavior of children is never an equivalent referential response to that of asking for the candy, it may nevertheless be regarded as a tool or instrument for obtaining the desired object. Possibly a clearer instance of this is found in the "methinks the lady doth protest too much" situation. Even the referee may note that what the referor says is a screen to conceal some act of omission or commission.

Again, the referor may reflect upon his own speech with the conclusion that he was overenthusiastic or perhaps overawed by his interlocutor. Thus a speech act may become frozen into an object which may serve as a substitute stimulus for something else. Though we have stressed only the fixation process as antecedent to the organization of a symbolic couple, undoubtedly the way is cleared for consummating that end.

Chapter VIII

Nonreferential Language: Vocal and Graphic

SPECIFICITIES OF LINGUISTIC INTERBEHAVIOR

The interbehavioral principle of psychology demands that each type of linguistic activity be studied, not only as a unique species of human behavior, as crude datum, but also as a specific field of interactions of stimulus-and-response functions. Thus, our descriptions and interpretations are required to reveal the type of configuration of the specific behavior fields, the nature of the stimulus objects, and the kind of circumstances under which the entire event takes place. In this chapter, therefore, I isolate and describe a series of interactions, differing both from referential activities and from the symbolic forms of nonreferential activities, though, of course, they are intimately related to both types of linguistic behavior.

NAMING BEHAVIOR

Naming interbehavior may be regarded as of two sorts. The first consists of originally applying a term to some new thing or event, as when a scientist first designates some actual or alleged phenomenon. For example, allocating such names as "proton," "neutron," "electron," "positron," to the various features of an atom; to a new planet called Pluto; or a Latin phrase to a new species of organism. Though the scientific naming process may be simple it is usually quite complicated. The second sort of naming is illustrated by the activities of parents in naming their newly-born child. Usually this type of linguistic action is very simple, though it might be rather complicated in certain cases.

What complicates the scientific naming process is that the thing or event to be named is a novel object that stimulates problems. The scientist assumes that he has come across something new that needs to be distinguished after which he invents a name to indicate its essential characteristics. By contrast with scientific nam-

ing, the mere arbitrary designation of a child as James or Mary is comparatively simple, though sometimes a bit of complication may set in if the parents disagree or competitive issues arise.

Now both types of naming may be complicated by a number of accompanying linguistic activities, both of the referential and symbolic classes. In the simple child-naming situation, the parents may indulge in considerable discussion concerning their attitude and choice. This may be the case, too, in the scientific naming situation in addition to some symbolic interbehavior. While in the simpler situation the accompanying linguistic action may be exclusively vocal, in the more complex situation graphic behavior may also be involved.

An interesting type of naming event is that in which A tells B the name of a flower; this is a distinct referential form of interbehavior. "This is Virginia Blue Bell, *Mertensia virginica.*" In other words, the activity of referring to the name of an object in the communicative situation of informing someone what name should be applied when referring to that object is not the same kind of event as connecting a name with an object in what is designated as the original naming situation.

COUNTING

While counting has many points of likeness to the original naming action, it is still very different. We are assuming that the behavior segment involves verbovocal behavior useful in attaining a certain result. Here we are dealing with a situation in which the stimulation consists primarily of knowing how many units are included in an aggregate or sum. Another form of counting is that in which the individual informs himself that putting so many objects together will result in a certain aggregate or set. We may describe the counting as an individual saying to himself, "17 put together with 9 makes 26." To be emphasized here is the fact that the counting procedure implies a tremendously large behavior equipment previously acquired in similar situations which are now operating in the immediate adjustments at hand, for example, the sums and products of various combinatory processes.

RECORDING BEHAVIOR

Record-making constitutes an enormous psychological preoccupation of human beings in complex cultures with an origin in simpler stages of being. For many reasons individuals create and preserve representations of their exploits, possessions, and all varieties of transactions. In this way rulers and other prominent individuals accumulate annals, histories, and monuments to glorify themselves or their nations, or protect themselves against losses. All this self-perpetuation and control over events is performed by means of words, pictures, and symbols, so that recording behavior is drawn into the class of linguistic behavior though for the most part as nonreferential performances. Not infrequently, however, the actions are intended to be referential.

The process of record-making is definitely of psychological proportions while the finished products are not. Numerous behavior segments of different types may be involved in the process, though it is clear that the employment of symbol objects established in the general current system makes the work easier than if new symbols or marks have to be constructed. It goes without saying that record-making may include behavior segments similar to those of naming and counting behavior.

WRITING AND INSCRIBING BEHAVIOR

In complex cultures writing and inscribing constitute necessary and important types of nonreferential linguistic behavior. Linguistic writing and inscribing, of course, must be differentiated from the nonlinguistic psychological activities of simply producing marks by the use of a writing tool, such as a pen, crayon, wedge, or pencil. Psychological performances such as doodling while being bored by a lecture, are completely excluded from consideration. Good examples of linguistic writing and inscribing behavior range from such activities as producing notes for directing others in some sort of behavioral performance to the most complex intercommunicative letter writing.

It is easily noted that writing behavior bears certain resemblances to recording behavior, though despite common features

they are on the whole quite different. What is common to both types of behavior fields is the action of producing a product but while in recording the product is emphasized in writing, it is the process of immediate communication that is the prominent feature. In general, what is characteristic of writing is the expansion of the activity of intercommunication. While verbovocal speech involves the immediate proximate presence of the referee, in the writing behavior situation he may be distantly located in time and space.

While analyzing the specific type of linguistic adjustment which is occuring in writing performances, as in all studies of behavior we are required to take into account specific details. In writing, for example, we must observe whether the individual writes definite words belonging to an existing language system, uses abbreviations or various kinds of shorthand. Neither is it insignificant what particular kinds of marks the individual makes. These various activities resulting in different productions suggest many important details concerning the individual's sociological or anthropological background. He uses particular kinds of letters for particular languages, he writes from left to right or up and down, etc.

Although writing behavior consists mainly of transcribing referential communication, such functions are not the exclusive origins of writing activities. Besides writing origins classifiable as indirect representation as in syllabic and phonetic or alphabetic transcription there is the process of direct representation of objects as in picture writing and the construction of sign and symbol objects for various purposes.

ECHOLALIC BEHAVIOR

Echolalic behavior may be generally described as a language-related form of vocal gesturing. Such behavior is admitted to linguistic membership primarily because it involves verbal babbling and may be functionally of use in the development of vocal language.

In normal situations infants perform vocal behavior as a pleasurable sort of activity, a form of psychological self-indulgence or playing. Children apparently exercise their vocal apparatus in

the production of organized sounds without any intercommunicative or symbolic function.

Echolalia also occurs as a sort of abnormal stereotyped or automatic behavior. The classic instance is the repetition of certain words or their combinations without any significance so far as the observer is concerned. The individual performer, however, may be interrelating his activity with various situations.

In general, the response patterns in echolalia consist of series of chains of vocal gesturing interconnected with a rather indefinite stimulus function from the standpoint of socially accepted linguistic behavior.

SINGING

Probably no one would think of adding singing behavior to the list of linguistic activities except for the presence of words. Actually a singer may be regarded as a musical performer except that he does not use a nonorganic instrument. When this is the case there is hardly room in the linguistic classification for such phenomena. Even here the enunciated words are so different from the nearest approximation in actual speech that no one could in the slightest degree identify or relate the two. And yet in some instances singing may approach the conditions of referential speech.

READING

Reading interbehavior may be of two distinctive sorts, referential and nonreferential.

NONREFERENTIAL READING

In this type of interbehavior, the material read consists primarily of substitute stimuli coordinated with responses to the subject matter written about. In a sense the words and sentences operate as visual symbols which stand for certain definite things. Probably the language material in the conventional sense of letters, words, etc., bears stimulus functions comparable to signals, notches, numbers, etc. Despite the differences in the details of the behavior fields, the words in a book one is reading function approximately the same as a street sign or any similar sort of indicator. Here we

must be on guard to differentiate between what are socially similar things; the fact that reading material as printed or written resembles transcribed speech offers no warrant for confusing entirely different sorts of behavior fields.

REFERENTIAL READING

It is undoubtedly true that frequently an individual interbehaves with the reading matter of a book in exactly the same way as he performs auditory responses in conversation. It cannot be denied that one may become so absorbed while reading a novel that the stimulus objects bear functions similar to those of referor speech behavior. When this is the case, reading becomes classifiable with definite referential activities. Since printed material stimulates the individual just as conversational speech does, the author appears to speak to the reader just as he would in ordinary conversation. Doubtless the most unambiguous situation of this sort is very similar to the reading of letters in which the referor actually is speaking to the referee by graphic means.

Chapter IX

Linguistic Events and Situations

BEHAVIOR SEGMENTS AS INVESTIGATIVE TOOLS

Not only are linguistic events exceedingly complex, but obviously they are also very intricately interrelated with other types of phenomena. Accordingly, it is essential that the student of language forge as refined tools as he can for the investigation of linguistic and interrelated events. We have already indicated in Chapter IV that for the objective study of psychological events the behavior segment constitutes the unit. For the investigation of linguistic phenomena, therefore, the linguistic behavior segment will prove to be of considerable value.

By means of this analytic tool we can isolate and define specific kinds of linguistic interbehavior. In other words, when we know the nature of the mutually operative functions of the stimulus object and response, including, of course, the medium and setting, we understand a psychological linguistic event. Taking all these factors into consideration we have criteria for distinguishing between linguistic and other kinds of psychological events, as well as between different types of linguistic adjustments.

The behavior segment, of course, is a scientific abstraction. It implies an atomization of the continuity of psychological events. It is, however, constructed upon an operational principle—namely, upon the basis of observing what happens when linguistic events occur, and is intended to take into account what the observer is primarily in contact with, and what he reports concerning his observations.

Specifically, by isolating linguistic behavior segments we can not only differentiate between all sorts of linguistic phenomena, but also check the descriptive and explanatory principles applied to them. We can test the work of the investigator in terms of his postulates in approaching linguistic events and also the validity of his observations and analyses of the data themselves.

We need not go further into the investigator's criteria than to take account of his interests and background. How does he approach linguistic phenomena? Is he interested in linguistic things as evolutions of language systems, or as momentarily occurring events? As to the latter, is he concerned with psychological or nonpsychological aspects, namely, physiological processes or historical continuities or changes in speech styles? Does he stress sufficiently the natural science version of psychology?

The investigator's approach determines, of course, his interpretation of linguistic events. Does he study sounds, words, sentences, or actual adjustments of persons? And finally, does the investigator actually consider that all that a speaker does is invariably related to specific conditions, involving in some cases persons spoken to and things spoken of in simultaneous connection, or in others the successive contacts of reacting individuals with symbol objects and their referents?

ANALYTIC VALUE OF LINGUISTIC BEHAVIOR SEGMENTS

The value of the behavior segment construction lies in its serviceability in the promotion of linguistic investigation. This construct can help us differentiate between varying types of linguistic events, and to interrelate them with each other, and with psychological behavior and nonpsychological conditions.

CHARACTERISTICS OF LINGUISTIC SITUATIONS

Students of language have for a long time entertained the tradition that everything involving vocal mechanisms is linguistic. This tradition is based upon the old established dualistic principle that connects psychic processes with organic action. They have assumed that verbal behavior involving conventional sound-making of the mouth is linguistic even though it is apparent that the verbigeration of abnormal persons is a very different thing from orderly intercommunication, and further, that authentic intercommunicative behavior occurs as manual and other forms of nonvocal gesturing. In a similar manner we may differentiate between applying names to things, counting, singing, reading, etc. We submit, then, that the analysis of specific behavior segments provides us an adequate instrument for the analytical study of different types of linguistic events.

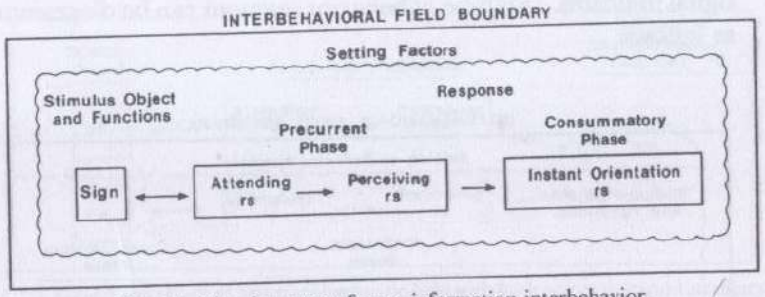


Fig. 11. The sign type of pure information interbehavior.

In most instances the isolation of a behavior segment can be best achieved by considering what kind of stimulus object with which the individual is interbehaving. To illustrate the differentiation between different behavior segments I present four types of situations.

(a) Sign Situation

The fundamental adjustment here is a direct noetic interbehavior with the stimulus object. Accordingly, the consummatory reaction system consists of a simple awareness of the sign's character as a stimulus object—that is, as a marker, for example, a street sign or a light on a pile of debris. There is essentially no intimation as to further action unless it is to inhibit behavior, as in the marker NO ENTRY. The sign type of behavior segment may be diagrammed as in Fig. 11.

(b) Signal Situation

In this situation there is an immediately contiguous stimulus object with an inherent function directing the performance of an operation or manipulation. The consummatory reaction system of the behavior segment consists of carrying out some sort of operation. The interacting individual goes, stops, turns right or left as the

signal indicates. This type of behavior segment can be diagrammed as follows:

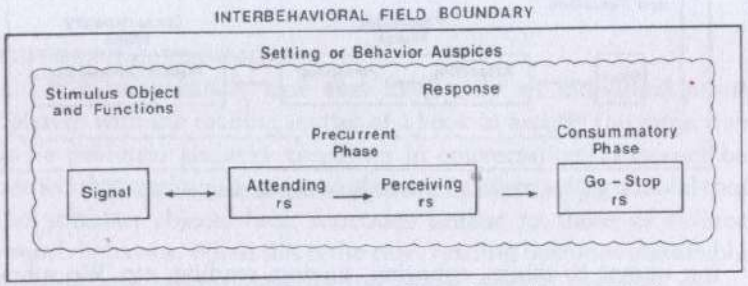


Fig. 12. The signal interbehavior leading to immediate overt action.

(c) Symbol Situation

The central feature in symbol situations is that the individual interacts with a codified object, that is, one that has been made to substitute for something else by the present actor, or by someone else. This process is well named "encoding." When the present actor reacts to a symbol which he or someone else has encoded, the operation is called "decoding." This may be a very simple procedure of recognizing the encoded object, for example, U.S.A., O.K., a trade mark, colophon, or logo.

Symbols are most frequently used to divulge information and to organize it in order to bring it to manageable form. Sometimes, however, symbols are employed to conceal information and to withhold it from someone. Such are the various military codes which constitute the basis for the cryptological industry. The outstanding features of symbolic behavior segments are shown in Fig. 9 and 10, pages 77 and 79.

Symbolic situations as noetic performances frequently combine with manipulative situations. In that case, an operational behavior segment is conjoined with the noetic symbolic behavior segment. Immediately upon decoding a military crypt, a combatant action is inaugurated. A more familiar example is the behavior of a piano player who strikes a certain key as soon as he "reads" a note. The combination situation may be represented as in Fig. 13.

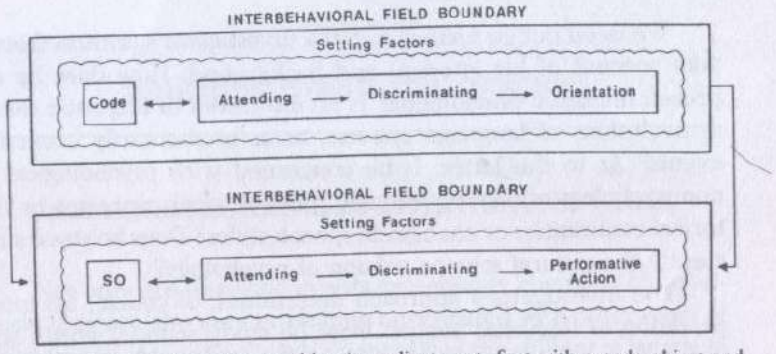


Fig. 13. Diagram of a combination adjustment, first with a code object and then with another stimulus object.

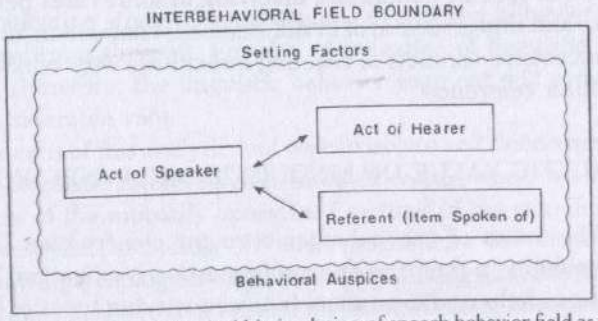


Fig. 14. Diagram of a typical bistimulation of speech behavior field as pictured in Fig. 4.

(d) Speech Situation

Since the genuine speech situation involves the simultaneous operation of an auxiliary and an adjustment stimulus function, as in Fig. 14, it contrasts with the other linguistic behavior segments or fields. The differences are clearly indicated by comparing the speech illustration in Fig. 14 with the diagrams numbered 9, 10, 11, and 12.

(2) DIFFERENTIATION OF BEHAVIOR SEGMENT EVENTS

The construct of behavior segments is also useful in distinguishing between the behavior events involved in the interaction of two persons in speech situations. Because the response of one person

is a stimulus for another in intercommunication it may readily be determined whether and which action is or is not referential. There are, of course, four possibilities, as indicated below.

(a) Actions of A and B may both be linguistic and referential. The obvious example is authentic dialogue. A's speech serves as stimulus for B, and vice versa.

(b) Only the actions of one person is referential. A speaks to B in a language system which B does not understand. B knows he is being spoken to but is unaware of the referent factor. His action, though psychological, is not referential.

(c) The third case of one action being referential is that in which A speaks to C but B regards himself as A's auxiliary stimulus object. Though A's action with respect to B is not referential, B's action is. An interesting example is that in which A in rehearsing a play cries out for help which B somehow overhears and assumes is referential, though it is nothing but morphological or simulative language. B, however, is ready to respond helpfully.

(d) The fourth and final possibility is the linguistic relations of A and B is that neither one is performing referential behavior with respect to the other. An example is the presence of B while A is rehearsing his play. B in this case is unfamiliar with the language A speaks. Accordingly in neither case are the two individuals performing referential behavior.

VARIATIONS IN LINGUISTIC SEGMENTS OF BEHAVIOR

(1) FIVE TYPES OF REFEROR BEHAVIOR SEGMENTS

Linguistic behavior is obviously highly variable, because it is so common and so definitely adjustive in so many different situations. Of the various types of linguistic behavior segments, the referor type is the most readily observable. Accordingly the description of this type of linguistic event is the easiest to make and the most convincing. We indicate below five types of referor behavior segments.

(a) S_j, S_x Both Present

As the diagram in Fig. 15 indicates, the adjustment and auxiliary stimulus objects are both immediately present. The response

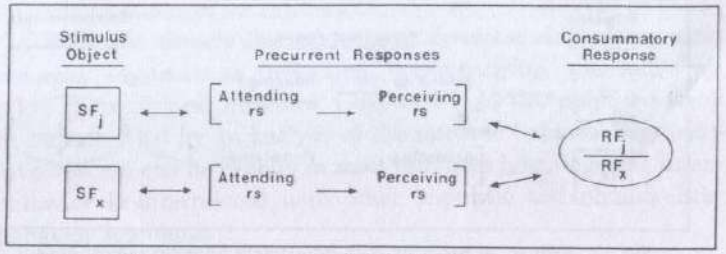


Fig. 15. Diagram of a normal linguistic field with both adjustment and auxiliary Stimuli Present.
SF_j = Adjustment Stimulus Function SF_x = Auxiliary Stimulus Function
RF_x = Auxiliary Reponse Function RF_j = Adjustment Response Function
rs = Reaction System

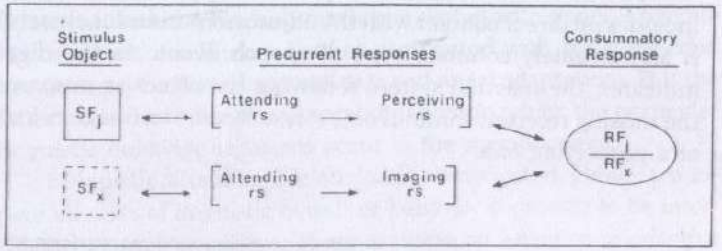


Fig. 16. Diagram of Linguistic Field with Auxiliary Stimulus Object Absent. Symbols as in Fig. 15.

may consist of a conventional vocal act which constitutes a matrix for (1) referent function to the adjustment stimulus object; and (2) a referring function corresponding to the stimulating function of the person spoken to. The character of the response matrix may be of many sorts, as we have pointed out.

(b) S_j Only Present

In this behavior segment, only the adjustment stimulus object is immediately present. In such a linguistic behavior field, the precurrent reaction systems are clearly different. Instead of perceiving the auxiliary stimulus object, the referor interbehaves with it implicitly through a substitute stimulus object. He may visualize it, or the particular reaction system may operate on the basis of the substitute function of the adjustment object.

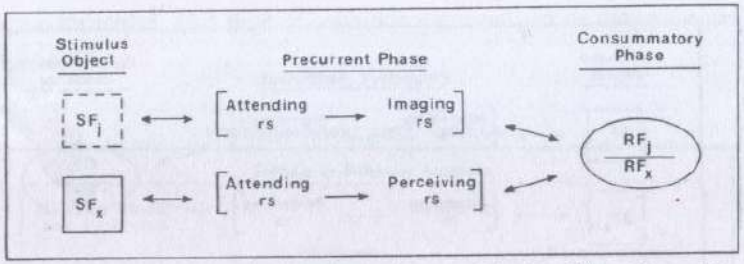


Fig. 17. Referential Behavior With Adjustment Stimulus Object Absent. Symbols as in Fig 15.

(c) No Contact with S_j

The interbehavioral field represented by the above diagram includes no direct contact with the adjustment stimulus object. This is an extremely common type of speech event. As the diagram indicates, the reaction system following the attention response to the missing referent stimulus object is served by an image rs instead of a perceiving one.

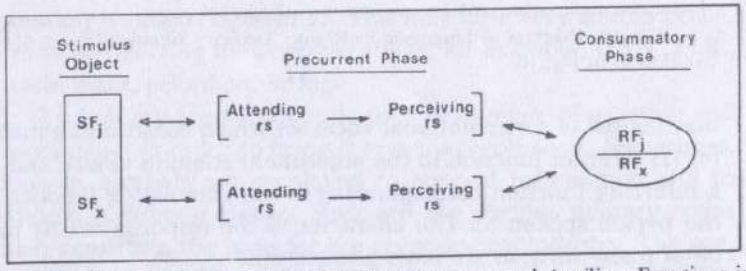


Fig. 18. Referential Field with both Adjustment and Auxiliary Functions in same object. (Symbols as in Fig. 15.)

(d) Functions of S_x, S_j in Single Object

An interesting type of linguistic field is that in which both stimulus functions inhere in a single object in direct contact with the speaker. In such fields the precurrent acts include definite perceptual response functions.

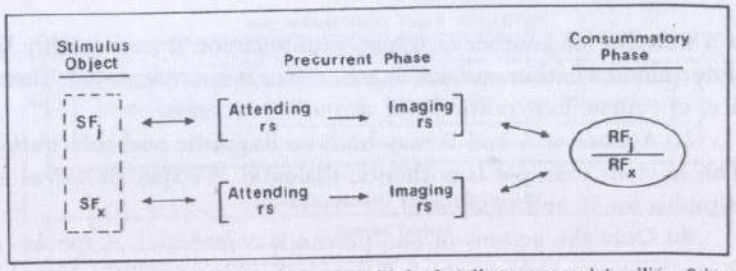


Fig. 19. Referential Interbehavior with both Adjustment and Auxiliary Stimulus Objects Absent (Symbols as in Fig. 15.)

(e) S_x, S_j Functions in Single Object, Which Is Immediately Present

Finally, there is the linguistic behavior field in which again both the S_j and S_x functions inhere in a single object, but one that is only indirectly present through a substitute object or act.

(2) THREE TYPES OF REFEREE BEHAVIOR SEGMENTS

Referee fields are of three types only, as in every case the auxiliary stimulus function inheres in an immediately present stimulus object, the speaker.

(a) S_j, S_x Inherent in Different Present Objects

The most obvious, though not the most common, referee behavior segment, is that in which the two stimulus functions each inhere in different immediately present objects, as indicated in the following diagram.

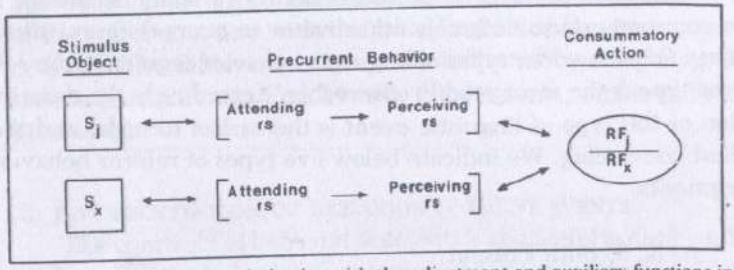


Fig. 20. Referee Interbehavior with the adjustment and auxiliary functions in separate objects.

(b) S_j Absent

The adjustment stimulus may be absent, as in the following schema.

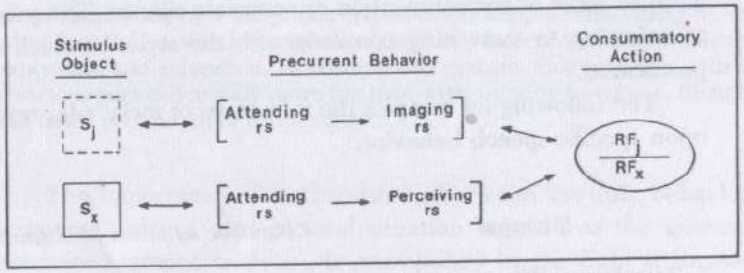


Fig. 21. Referee Interbehavior with adjustment stimulus object absent.

(c) S_j, S_x Inherent in Same Object

Both S_j and S_x functions inhere in the same stimulus object, as when the referor speaks of himself.

In this type of behavior segment and in the type in which the adjustment stimulus object is absent, the comprehension of the referee is aided by the total situation in which the speech event occurs. In such cases the presence of implicit references are prominent and highly effective.

It may be noted that probably because of the frequently occurring behavior segments lacking the presence of adjustment stimulus objects that referee language behavior has been confused with the symbolic form. However, the careful observation of the differences in the respective behavior segments reveals the variations.

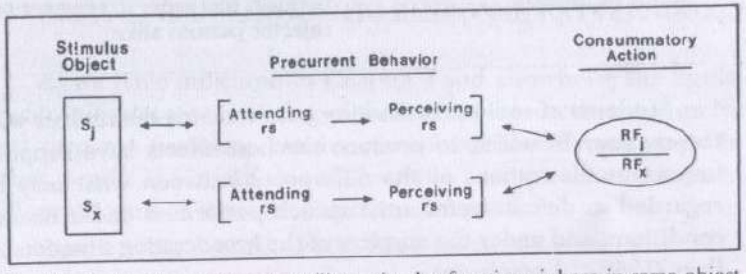


Fig. 22. Both adjustment and auxiliary stimulus functions inhere in same object.

(3) INTERRELATION OF LINGUISTIC AND NONLINGUISTIC EVENTS

We have already discussed the interrelationship of linguistic behavior segments as preceding, accompanying, and following other psychological activities, Chapter VI. At this point we want to indicate that by an analysis of the intrinsic behavior segments involved we can be certain in most instances how linguistic interbehavior is interrelated with other linguistic and nonlinguistic behavior segments.

RELATIONSHIP OF LINGUISTIC EVENTS AND LINGUISTIC SITUATIONS

It is hardly necessary to point out that particular linguistic events are always intimately interrelated with larger linguistic situations, and also more distantly connected with general psychological situations. We are further acquainted with the distinction between psychological adjustments and social adaptations. It is the latter that constitutes the general situations in which the particular linguistic behavior segments occur as the specific events.

Linguistic situations are obviously complicated. Hence we expect all sorts of linguistic events or behavior segments to be interrelated in such situations. If we examine an intercommunicative situation we find many referential events involving a variety of specific patterns, especially in referor language. The speaker not only utters sound patterns, shrugs his shoulders, points in various ways, smiles, frowns, or otherwise responds to his referee and referent, but also interlocks his referential activities with nonreferential behavior of many varieties. While the referee may not so intensely complicate his behavior he only remains a referee for brief intermittent periods. We can scarcely do justice to the concept of a behavior segment were we to disregard the fact that behavior segments occur in brief fractions of seconds, whereas linguistic behavior may occupy appreciable intervals of time.

ENVIRONMENTAL INFLUENCES UPON LINGUISTIC BEHAVIOR SEGMENTS

As behavior segments, linguistic events are of course conditioned by the stimulus and response functions inhering in the

stimulus objects and organisms respectively. For example, when two particular persons interbehave linguistically, there is a problem of coincidental adjustment. Unless A speaks a language B understands there will be no intercommunication. Again, in order that A's referor language be an adequate stimulus for B, it must be within B's hearing range and capacity. Implied here is a mutuality of previous linguistic development involving a common acquaintance with adjustment stimulus objects.

Aside from the obvious factors of hearing range and capacity there are the more subtle influences of setting. Not only must intercommunicating individuals be in sufficient contact for interbehaving with each other, but such factors as visual, tactual, and auditory acuity must be favorable. Again, the influence of particular settings must be taken into account. To talk with each other in a machine shop or boiler factory individuals must accomodate themselves orally and auditorially or shift to sign language.

In addition to the intrinsic behavior segment factors, linguistic events are further conditioned by a larger humanistic framework. Speakers frequently are under the necessity to accomodate themselves to conditions environing the linguistic behavior segment. These environing factors are quite different from the more intrinsic behavior segment setting. For example, when one must be careful as to who overhears a conversation a certain constraint arises from this general environmental condition.

The influence of environmental conditions upon speech may be illustrated by the various answers given to the question: What is the function of language? (1) "to express thought" (popular notion); (2) "to conceal thought" (Talleyrand); (3) "to cover up the fact that one has no thoughts" (Kierkegaard). One can easily distinguish between the actual process of saying something (performing linguistic interbehavior), that is, asking and answering a question, denying something, pleading, etc., and the larger social situation to which one must adapt oneself, whether by speech or some other mode of interbehavior. A diplomat at a state dinner must say many things which are remote from the larger social background under which he says them. Sometimes these two conditions coincide. In the home of a hanged man, one does not mention rope. In order to adapt oneself socially, one does not speak about certain things.

This contrasts with the specific situation of speaking positively in a suitable social situation. When one cannot separate the two situations, one can be pretty sure that there is no truly referential response taking place. Social adjustment may demand transition to another topic of communication or complete silence. The process of referring to something contrasts with the style in which it is performed.

The following list samples the influences of social adjustments upon specific speech behavior.

Situation	*Linguistic Behavior Modification*
1. Zero Speech Situation: Company commander calls for volunteers	Most soldiers make no answer
2. Speech Change Situation: Speaker utters improper references	Hearer changes subject
3. Conformity Situation:	Speaker and Hearer both speak French, Chinese, Bantu, or English
4. Adequacy Situation: Despite socioeconomic variations in speakers, minimal similarity of behavior suffices	Specific auspices of speech compensates for differences in speech patterning
5. Contrary Speech Situation: Speakers disagree about events referred to but continue to speak	Speech lacking in adjustment, arguments unconvincing to other speaker
6. Nonchalant Speech Situation: Speaker disregards identity or status of listener	Merchant says, articles in style, popular, best-seller to receptor and rejector persons alike.

Students of radio broadcasting who concern themselves with the manner in which to produce the best effects have supplied important illustrations of the differences between what may be regarded as definite referential speech performed under normal conditions, and under the auspices of the broadcasting situation. As Pear (1886–) points out,

Anyone who listens to a broadcast talk by an intimate friend may find (a) that the talk seems partly depersonalized—it is like, and yet not like, the speaker, or (b) that the customary visual accompaniments of the speech are imagined, or (c) that there is little difference between the talk as broadcast and as it would have been if given "straight." But the easthetic unsatisfactoriness of a telephone conversation suggests that many of us, when face to face, watch the speaker, and freely interpret changes of facial expression and coloration, of posture and gesture. Conversation with a vivacious person is usually more fun than with a stodgy-faced one, though the latter may be more interesting.[1]

The importance of distinguishing between intrinsic behavior segments, setting, and societal situation (as well as the general behavior segment analysis), is exemplified in the light it throws upon differences in types of linguistic events. For example, by comparison with referential speech, symbolic interbehavior is strikingly independent of environmental conditions. The reason for this is, of course, that the symbolic event is uniquely focalized in light of the interrelationship of the substitute and adjustment stimulus functions. Though symbolic interbehavior may be influenced in an all or none or presence or absence manner—that is, environmental conditions may determine that such interbehavior should not occur at all—referential interbehavior is exceedingly sensitive to the larger humanistic framework.

This difference is also exemplified in the manner of the intrinsic setting. Aside from context, when symbol-signs have varying stimulus functions symbolic stimuli allow for very little influence of setting. The context is very great, however, when referential behavior segments are under observation.

VARIATIONS IN LINGUISTIC RESPONSE PATTERNING

As we have indicated in Chapter I and elsewhere, the fundamental adjustment consisting of the mutual interaction of stimulus and response functions can be carried out in different ways. In other words, the stimulus and response functions can inhere in different forms of stimulus objects and responses.

[1] Pear, T. H., *The Psychology of Conversation*, London: Nelson, 1939, p. 24.

VERBOVOCAL SPEECH

So far as vocal-auditory response patterns are concerned, the question is of interest whether the response consists of a single reaction system or a pattern of such systems. Inasmuch as the ordinary referential behavior segments are complicated patterns, the psychological linguist frequently faces the question of units. As we know, the linguist who works with textual materials faces the question whether the unit of action is a word, a series of words, a syllable, series of syllables, or sounds. The psychological linguist also must consider whether there ever occurs a referential response of a single type—that is, vocal—or whether there always are components of the nonvocal gestural sort. However difficult analyses become, it is only by taking such problems into consideration that we can hope for a useful understanding of psychological linguistic phenomena.

WHISPERING

This type of response pattern contrasts with the audible vocal pattern. Generally speaking, whispering is a particular response pattern operating in a behavior segment conditioned by particular settings. The amenities to be observed in public, whether to preserve privacy or to respect the convenience of others are determining factors. On the other hand, the specific referential event is describable in terms of the interbehavior of the intercommunicating individuals and the referent.

SUBVOCAL SPEECH PATTERNS

While performing imagery behavior the individual not only performs vestigial responses of the sort he displayed in the original situation, but he also supplies details by means of subvocal action.

MUTE SPEECH

Of especial interest in the referential field are the behavior segments involving series of reaction systems of the nonvocal or gestural sort. Of similar interest are the response patterns of the tactile and vibratory sort.

Paget (1869–) asserts that "Helen Keller lip reads by touch,

placing two fingers across the speaker's lips and her thumb under his chin." [2] In this connection psychologists like Katz (1884–1853) and Gault (1874–1972) raise the question concerning the intermixture of vibratory and tactile responses and whether there are such reaction systems as the vibratory sort independent of the tactile.

CLASS STATUS SPEECH

Much of the actual utterances of persons reveal cues as to the social class to which the speaker belongs. They may indicate that he is an upper, lower, or middle class person, a scholar, a moralist, a conservative, or radical. Also, the style or manner of speech points to various personal traits.

THE PROBLEM OF LINGUISTIC DISTORTION

A specialized problem relating to verbovocal speech concerns the limits of distortion which affect the hearer or referee. Acoustic engineers have assiduously studied the problem of the efficacy of sounds for understanding speech. Especially telephone engineers have experimented upon the results of telephone conversation when certain frequencies of sound waves are eliminated from utterances. Such investigations, as valid as they are for the situations in which they are carried on, are only suggestive of a larger set of problems concerning linguistic interbehavior.

A fundamental question arises concerning the limit of the behavior of one individual in order to communicate with another person. Here at once our linguistic event principle in connection with the general situation comes in. It is easily demonstrated that the amount of distortion of actual utterances depends directly upon the immediate specific situation. When the two interacting persons are in the presence of the adjustment stimulus and the situation is well defined, the amount of distortion possible is extremely great. When on the other hand the total linguistic situation is more attenuated, as in the absence of the adjustment stimulus object and the unfamiliarity of the referee with the factors of the situation, a much smaller distortion effect interferes with speech and hearing.

[2] Paget, R. *Human Speech*, New York: Harcourt Brace, 1930, p. 174.

Chapter X

The Analysis of Linguistic Reaction Systems

LINGUISTIC ANALYSIS: CONSTRUCTION OF ABSTRACTIONS

Individual linguistic behavior fields called behavior segments, though abstracted from other events with which they are interrelated, constitute indivisible units or totalities. Still, for the better understanding of such events it is expedient to reduce them to a series of component factors. Obviously, then, these reduction-products consist of descriptive abstractions constructed for analytic purposes.

Such component factors we call reaction systems. They may be described as the smallest unit acts into which an individual's linguistic behavior can be dissected. Naturally they presuppose an intact organism in contact with stimulus objects. Analysis in psychology clearly consists of a series of reduction stages. To reach reaction systems, analysis subtracts from the original complex events, and divorces the response factors from the situation in which the behavior segment operates, and from the objects and their stimulus functions. Fundamentally the reaction-system construction reveals the biological participants and their operation in linguistic events. Despite the necessity and usefulness of such arbitrarily analytic constructions, we must avoid the error of thinking that they can be resynthesized into linguistic events. In other words, isolated bits of anatomical and physiological information, no matter how well authenticated, can never make up a sum of psychological description.

COMPONENTS OF REACTION SYSTEMS

The operation of reaction systems, upon analysis, yields the ten following component phases or factors:

(1) STIMULATIONAL PHASE (PLUS CONTACT MEDIA);

(2) ATTENTIONAL FACTOR;

(3) DISCRIMINATIVE PHASE;

(4) MOTORIC ASPECT;

(5) AFFECTIVE FACTOR;

(6) ACTION OF RECEPTOR MECHANISM;

(7) NEURAL FUNCTIONS;

(8) ACTION OF EFFECTOR MECHANISM;

(9) GLANDULAR PHASE;

(10) MUSCULAR PHASE.

These components, we repeat, are abstracted from the reaction system events, as they occur when an individual speaks or performs other linguistic behavior. They provide a better understanding of language than would be the case without analysis. Strictly speaking, however, so dynamic a process as a psychological reaction system certainly cannot be said to be composed of parts. All the more it is important to emphasize the dynamic indivisible character of a reaction system since the possibility of correlating some of the factors with anatomical structures may be taken to mean that some or all of the factors involved are autonomous. For example, because the muscular, neural, and glandular processes can be correlated with the muscles, glands, and neural elements involved, one might slip into the error of thinking that a reaction system consists of parts, whereas nothing could be farther from the truth. Not only has a reaction system no isolable elements, but the whole reaction system is not an autonomous entity. It is, rather, a reciprocal phase of a segment of behavior; the other phase being, of course, the stimulus object and its functions.

(1) STIMULATIONAL PHASE PLUS CONTACT MEDIA

No action on the part of an organism can occur without some corresponding action on the part of things and events. For historical reasons, the latter are called stimulations or stimulus functions. Also there are media of contact between the organism and the stimulating objects or conditions, for example, light in visual reactions, and air waves in hearing behavior. Contact media, unfortunately, have been regarded as the stimuli for psychological behavior. For convenience of exposition we emphasize verbovocal speech behavior. However, the same principles apply to every type of reaction system.

Auditory Media

Students of sound and hearing agree that there is a spectrum band of air waves with a vibration range between 20 cycles at the low end, and 20,000 cycles at the high end that contains all the stimulational correlates of hearing. Vocal speech sounds are, of course, correlated with a limited range of the audible spectrum. Some authorities place this range at 75 to 5,000 cycles per second, with the most favorable frequencies below 1,000 cycles.

That vibrational phenomena are essential factors in hearing has been demonstrated by Robert Boyle (1627–1681) some three centuries ago when he showed that a bell set into vibration under a jar from which air has been exhausted cannot be heard. But even today, psychologists do not agree as to the role played by vibrational events in hearing and speaking situations. As we have mentioned above, mentalistic psychologists look upon the frequency and amplitude of vibrations as stimuli for activating receptors and ultimately the brain to produce psychic qualities called sensations. The question must be raised as to the claims that the interbehavioral psychologist views vibrational events as simply indispensable media for the performance of auditory behavior. The study of authentic speech situations as against isolated sounds casts great doubt on the widely assumed correlations between particular sound vibrations and sounds produced and heard, while the knowledge of the biology involved indicates the frailty of the general dualistic interpretations of speech events.

Tactile Media

Deaf individuals cannot, of course, come into contact with auditory vibrations. Their contact must be through tactile vibrations and pressure contacts with stimulus objects. Workers with deaf individuals have developed vibratory mechanisms, teletactors, etc., for the purpose of teaching the deaf to intercommunicate with other individuals.

Visual Media

Visual linguistic stimulation constitute prominent means of intercommunication. These operate both in referential and nonreferential linguistic situations. Both these forms of contact remind us strongly that we cannot build up a psychology of linguistics on the sole basis of sound.

Compound Linguistic Media

For the purpose of correct thinking about linguistic fields we cannot overlook the fact that in actual speech situations we generally have complex stimulation. Probably most speech situations involve combinations of visual, auditory, and other contacts.

The Bistimulational Principle

So far we have based our distinction between stimulation and contact media on the differentiation between phases of the auxiliary stimulus. But we must also consider the fact that a referential linguistic situation cannot be regarded as a response based entirely upon sound vibrations. To consider actual situations, we shall have to take into account the contacts of the individual with the objects and events constituting the adjustment stimulus objects. Let us notice, too, that in symbolic nonreferential linguistic situations the stimuli are primarily visual and not auditory or tactile.

(2) ATTENTIONAL FACTORS

Every behavior segment or behavior field implies a shift from one item in the behavior continuum to another. This shift may be well described as the actualization of a potential stimulus object and stimulus function. The actualization process, of course, is embedded in the general setting or auspices under which the individual is behaving at the time.[1]

(3) DISCRIMINATIVE PHASE

Every psychological response to a stimulus is discriminative in the sense that the reaction is a definite specific adjustment to some particular object, condition, or other type of stimulus. Whatever we say, read, or hear, is a definitely reciprocal phase of a situation in which the stimulus factor plays a prominent and essential part. Especially is this perceiving factor observable in the case of language in which there is so delicate an interrelationship of the two most salient phases of a behavior segment.

We must constantly emphasize that the discriminative factor of a reaction system is an indispensable general condition of the individual's response to language stimuli. Because the organismic character of psychological phenomena has been rather carelessly overlooked, and because there is no specific structural counterpart of the discriminatory functions as there is of the muscular, neural, and glandular factors, psychologists from time immemorial have nevertheless posited an analagous structure which has been traditionally called soul, ego, consciousness, or other psychic something, in the various cultural periods.

Just how this discriminative factor operates in language reactions is well illustrated by the fact that to stimulate a person to perform a language response he must be offered a very specific language stimulus.

(4) MOTORIC ASPECTS

By the conative factor or component of a reaction system is to be understood the movements corresponding to the different stimulational phases in speaking or listening including pauses, while listening to what someone is saying if the speaker says much as in lecturing or sermonizing. The listener must respond to the speaker's stimulation in some fashion, though not necessarily matching the serial order of what he says.

[1] For an amplified discussion of attending behavior see Chap. XII; also Kantor, J. R., *Principles of Psychology*, Vol. I, Chicago: Principia Press, 1924; and Kantor, J. R., and Smith, N. W., *The Science of Psychology*, Chicago: Principia Press, 1975.

We note the changes of eye movements, changes in position of the head with respect to the shoulders, alternate bending forward and back, etc. In case of reading, we can isolate very definite movements in the eyes, a sort of alternate pause and jerkiness. These eye movements in reading are correlated with other changes in the head, as indicated in the case of the listener. But since the specific stimuli we spoke of are words arranged in linear patterns, the primary eye movements are the outstanding motoric factors.

(5) THE AFFECTIVE FACTORS

These are the feeling phase of reaction systems, observable in many cases of language reactions. Dependent upon the stimuli words and general language field, the individual when hearing or speaking will be in a pleasant or unpleasant mood or a neutral one. He will appear to be strained or relieved, calm or excited, depressed or gay, etc. Clearly, these affective characteristics of responses are not found unless the stimulating language imparts information or description of acts or events, or involve commands of some sort. This is so because human language reactions always represent definite adaptations. When we think of responses to single words, of course these affective qualities will not appear at all, or else will be very vague and of no appreciable intensity. However, as we can very readily surmise, it is always possible to present word stimuli to individuals which not only will elicit in them affective reactions, but may induce very definite emotional conditions.

(6) ACTION OF RECEPTOR MECHANISM

In every segment of behavior the description of responses must include specification of the particular functions by which the organism adjusts itself to stimuli. Among these functions are numbered the receptor organs which primarily put the organism into contact with stimuli, for example, the eyes in seeing, the ears in hearing, the hands in touching, etc.

For practical purposes, then, we must think of the contact functions as being merely the means of keeping the person alert and sensitive to the media of stimulation, that is to say, retaining him in a condition of receptivity for the visual and auditory stimuli which the stimulating person offers the reacting individual. In order for language and other reactions to occur, it is necessary not only that someone should speak, but that someone must also hear or see him do so.

A word of warning. We must under no circumstances think of the focusing and contact functions as autonomous actions, but only as phases of larger activities. We have already indicated that hearing and seeing are large complex adjustments, and so we may add that as a matter of fact, hearing and seeing are themselves only phases of still larger acts. We can seldom speak of just seeing, for when we look we look as part of standing and sitting in particular places, or standing and sitting rather than moving, etc.

Another important consideration. We never make only one kind of contact with a stimulating object. We do not hear through our ears alone, but through our eyes, also. And conversely we see things through our ears and touch reactions too. In all cases we do nothing less than act as a complete and complex person with all the numerous reaction systems which make a complex response to a stimulus situation, and which moreover may be influenced by a very elaborate setting.

(7) THE NEURAL FUNCTIONS

As prominent component functions in language we must place the neural phases, since every language reaction, being a highly organized specific adjustment, must comprise a great deal of coordination and integration. It is these functions that are largely ascribable to the nervous activities.

In this section again we must be strictly alert to the various pitfalls. In the first place, we are not concerned with the properties of anatomical structures, and in the second place, we must eschew the mistake of looking upon the neural function as in some sense the operational cause of other component functions of reaction systems. The conception of reaction systems positively militates against the notion that any factor is of greater importance in the system than any other, or that any one function can be the cause of any other. In our description we merely differentiate between what appears to be analyzable features, all of which chronologically speaking are operating at the same time. When one utters a word, one performs a unitary organismic reaction, in which the involved

muscle movements are not conditioned or caused by the neural functions; but rather, both functions are the simultaneous participants in an interbehavior. Whatever total unitary response occurs is based on the fact that the reacting person has previously acquired or organized the response-stimulus behavior which now constitutes a single event.

To make the neural functions prior and causal to the other functional components of a reaction system implies that the former can operate independently of the latter even for a brief space of time, a view which is most flagrantly opposed to the facts. One might just as well say that the muscular functions are the causes of the neural conduction, because it is the need for particular contraction and extension of muscles and for the integration of lips, tongue, throat, and other muscle functions which determine what specific sorts of nervous action shall occur.

A similar problem arises as to when the affective and discriminative factors operate with respect to the other components, for if we say they occur first and determine the others, then we may well ask whether they are not thought of as acting independently of the rest of the organism. And if they operate later, then what is their function in psychological action? It appears that we can only conclude that a reaction system is a unitary activity whose various components function simultaneously.

The importance of this entire problem of behavioral unity induces us very strongly to indicate how the falsifying views of serial operation have attained to more or less scientific respectability. I believe that there is here the influence of physiological procedures. As is well known, physiologists ordinarily specialize on the actions of separate structures of the bodily organism, such as the neural, muscular, and the various other organs. In practice, such abstracting views may lend themselves to experimental techniques, though under natural circumstances these diremptions of a unitary functional system are impossible. Perhaps the greatest contrast between the physiological and psychological viewpoint may be found precisely in the fact that the latter is dealing with a dynamic organismic interaction of a person and his stimuli, while the former deals with the abstracted functional phases of the anatomical parts of the person.

Despite the organismic unity of organisms and their actions, the tradition prevails of dividing the actions of the nervous system factors of reaction systems into three phases, namely, the afferent-conductive functions, the central-synaptic coordination, and the efferent conduction processes. The afferent functions consist of the factors operative in integrating the various contact points of the person (the receptor mechanisms) with a central, or cortical, coordinating center. In detail, the afferent functions operate to connect the eye, ear, and touch receptors of the hand, throat, and other parts of the organism with the brain, whether through direct paths as in the case of the optic or auditory nerves, or more indirectly through the spinal cord, as in the case of the hand receptors. The afferent and central functions of the nervous system serve to coordinate the reactions of organisms to stimulus situations by means of efferent conduction to the various muscle and glandular mechanisms.

So far as concerns speaking, reading, and writing, it is customary to regard as central synaptic coordination locals primarily the functioning of the cuneus (optic center), superior convolution of the temporal lobe (auditory center), and the post central region of the brain (somesthetic area), for afferent functions and the posterior part of the inferior frontal gyrus (Broca's area) for efferent functions.

It is unfortunately still true that many neurologists and physiologists believe that the seeing or hearing of a stimulus consist of some sort of psychical processes which operate when certain anatomical structures are put into function, and that speech is consequently a motor act caused by the operation of motor centers. The naivete of such a view is manifest when we consider that it violates the fact that the nervous system operates always as a whole, and not in parts, although it is true that every adjustment of the person constitutes a focalization or emphasis of the person's action.

Conclusive evidence, if it is still required to convince anyone that speech actions are not controlled by the operation of so-called speech centers, is the fact that there is no close correlation between the destruction of specific points in the cortex and the loss of speech. Of course, while it is impossible to say strictly that the failure of any phase or component function of a reaction system to

operate will prevent the rest of the system from operating because of the unity of the whole system, still we may ascribe a faulty reaction to some anatomical lesion. For example, if our optic nerves are destroyed we will of a certainty not be able to perform visual reactions, but this does not mean that seeing is the action of the optic cord. The same thing is true of the brain centers, which are the only points of connection between projective and other neural fibres. Plausibility could only be lent such specializing views by the fact that we are dealing with complex mechanisms, the destruction of a part of which may tend to the functional destruction of the whole. We have already indicated that such a view is predisposed to posit a "psyche" which is somehow correlated with the neural functions. The manner in which this view outrages facts is a sufficient condemnation thereof.

Furthermore, such a view as we have been describing condemns itself by its unsalutory divergence from the fact that language consists of complex social or cultural reactions, and not merely of simple physiological mechanisms correlated with psychic stuff or functions.

(8) THE EFFECTOR MECHANISMS

For the sake of adding as many definite component features as possible to the description of reaction systems, we suggest that the distribution of the neural functions over a more or less wide area is accomplished by an effector mechanism which operates to focus the organism's responses in much the same manner that the receptor functions mediate the original contacts of the person with his stimuli. These effector functions may be correlated with the anatomically isolable motor end plates. These motor end plates on the anatomical side provide the connections between the neural, muscular, and glandular functions and their structures.

(9) THE GLANDULAR FUNCTIONS

Only a casual observation of a person performing linguistic reaction systems is required to impress us with the large place which glandular functions play in such behavior. In the first place, in verbal speech reactions, the salivary glands operate to keep the mouth moist, thus facilitating the functioning of the mechanism of

speech. This is obviously the most simple sort of glandular function in speech responses. Turning now to the more complex glandular operation, we must point out how the function of the glands work to bring about general conditions in the well being of the organism, and in the excitatory or depressive feeling states which in turn bring about changes in form and content of language performance. Observe that if specific responses are adaptations to surroundings, whatever conditions are represented in the person through the operation of glandular mechanisms will have their influence upon the resulting speech. Probably the most striking example of the operation of glandular mechanisms in speech is the influence of sex gland functioning. Observe the heightened expression, the vivacity, the rapidity and intensity, the sometimes increased or decreased clarity of pronunciation, when one person speaks to another who stimulates in him complex glandular functioning of this order.

Obviously, when we are discussing glandular functions in speech, we have to pass beyond the boundaries of single reaction systems; we must think in terms of entire complex reaction systems, or the complete person's actions at any one moment. Possibly one very excellent way to approach the glandular functions in speech is to consider that as a matter of fact both our simple and complex feeling behavior is to a considerable extent conditioned by the glandular functions of organisms. There can be no question as to the great influence of feeling factors on speech. So far does this influence go that certain theorists claim that the entire process of speech first became developed in human beings as a means of expressing feeling impressions. This conception is celebrated in the statement that language is poetry.

(10) MUSCULAR FUNCTIONS

In attempting to indicate the place of the muscle functions in linguistic reaction systems it is expedient to consider separately (1) sound making, (2) numerous gestural and (3) more generalized reaction systems. To do all this would certainly entail the mention of all the musculature described by unabridged anatomy treatises. However, for our present purposes it will suffice to refer to a few muscles concerned in the operation of the larynx.

For the closure or reduction of the glottis—the passage-way between the vocal cords—there are the following muscles:

1. Thyro-tenoid
2. Lateral Crico-arytenoids
3. Interarytenoids

For spreading the glottal lips:

1. Posterior Crico-arytenoids
2. Crico-thyroids

For tensing the glottal lips:

1. Crico-thyroids
2. Posterior Crico-arytenoids

For relaxing the glottal lips:

1. Thyro-arytenoids
2. Lateral Crico-arytenoids.

Obviously the operation of the larynx in speech behavior is only a partial feature of the total behavior of the individual. The above examples simply suggest the place of muscles in reaction systems. We need not stop to enumerate the muscles involved as primary factors in breathing and all types of gesturing. It is expected that only because of convenience, and only for convenience, have we proposed the examples of verbovocal speech which is only one type of linguistic intercommunicative behavior.

Chapter XI

Linguistic Products

LINGUISTIC PRODUCTS AS THING LANGUAGE

We are now thoroughly familiar with the fact that the linguistic domain comprises both behavior and things. Psychological linguistics is concerned with linguistic things only as probable stimulus objects, either for linguistic or nonlinguistic reactions. But it is highly important to notice that linguistic things are primarily the products of communicative speech. Furthermore, actual psychological behavior may function as things. An example is hearing a speaker utter speech in an unknown language system. This speech can only be interacted with as things. It may be recognized as speech, but it is not linguistic behavior except for a speaker and a hearer acting within the same dialect. Excluded from consideration here, of course, is the speech overheard by a bystander who understands what is being said to someone else.

The production of thing language is a process of fixating referential behavior, writing, or transcribing speech behavior. This is done for a number of purposes, such as long distance communication, or for annalistic recordings. In the current period of recording technology, many conversations are stored on magnetic tapes. The process of tape recording preserves speech for various purposes—commercial, political, annalistic, and so on.

LONG DISTANCE COMMUNICATION

Through the fixation of messages, persons can communicate at long distance. Referential speech is the underlying basis for all long distance communication, telephonic, literary, etc. Linguistic products or thing-language in profusion result from long distance and time interval communication. Probably most linguistic things are derived from referential behavior fields.

LANGUAGE-THINGS AS CULTURAL IMPEDIMENTA

Inscriptions, recordings, manuscripts, books, etc., are things just as other cultural implements, and must be regarded as the

remains of the activities of persons. Linguistic things are derived from fundamental speech performed in adjustments in particular human groups. We, however, disclaim the false theory that cultural equipment is exclusively based on psychological phenomena, but rather that the locomotive, telegraph, radio, and computers, have developed during a long technological evolution based on the behavior of individuals. Civilization has developed an ocean steamer, initially from the natural floating of logs. All cultural products are both psychological and nonpsychological.

TWO SOURCES OF THING LANGUAGE

Although the primary source of linguistic things is to be sought in referential adjustments, that is not the only source. A second source is in nonreferential vocal or graphic language, and the manipulative behavior of inscribing, marking, and recording symbols and signs.

The nonreferential mode of constructing language things is excellently treated by general linguists who study the origin and development of alphabetic writing. The prevailing linguistic theory is that all alphabets come from one alphabet, whose symbol units were made from pictures of things. General linguists trace the origin of the modern Western writing to Near Eastern developments of syllables and words from pictograms to a Phoenician system that has undergone various modifications to its present day forms. It appears clear that alphabets and writing, even though not entirely based on referential language, is hardly unconnected from remote referential influences. Alphabets are comparatively late and unique constructions. Chinese has no alphabet. Once created, thing-language is a definite potential for good or for evil in linguistic situations. However, we are at present only interested in the process of producing language things as products. Once speech is fixated, it can and does greatly influence speech itself, what we speak of and how.

MODES OF FIXATING LINGUISTIC INTERBEHAVIOR

How do language products derive from actual referential speech? This is the basic problem of the modes of fixating linguistic interbehavior. In the beginning, individuals interbehave linguistically, that is, make common references. This period antedates the era of spelling or writing. In this original referential adjustment period, A was not even aware that B produced *sounds*. A's auxiliary stimulus was the referential *action* of B which may have been primarily gestures. When A answered B, the latter only attended to A's adjustmental behavior in close connection with the circumstances of the communicative situation. In the course of development of language things, the fixation proceeds by the mutual repetition of the action of the participants in the linguistic situations. When vocalization becomes prominent, then fixation of verbal patterns results in the formation of common or standardized things like sounds, sentences, vowels, consonants, and so on.

COMPLEX TYPES OF LANGUAGE THINGS

In the domain of linguistics, the mot of Wilde that men also live by catchwords takes on a tremendous significance. Not only is speech and linguistic intercommunication treated as abstractions, but also living speech is converted into abstract counters. In the following paragraphs we consider several grand types of language things.

STANDARD LINGUISTIC SYSTEMS

Suppose one learns Italian or some other language from a book. What has been accomplished? Only highly artificial utterances. One presumably imitates what an Italian says when he speaks. But much of the Italian's speech is gesture and even more of it consists of local dialectal performance—the drama of speech. The abstract fixations result in a radical departure from the behavior that constitutes a language behavior situation. Thus the psychology of language is basically more at home in the domain of dialectal instead of standard language, a language which is more alive than the artificial fixations. Dialectal speech itself often amounts to idiolectal performances of living speakers. Standard language systems are thus thing constructions greatly remote from psychological intercommunicative behavior.[1]

[1] In a review of Luigi Meneghello's book (*Times Literary Supplement*, July 2, 1976), *Libera Nos a Malo*, Donini asserts that the author frequently uses authentic dialect words impossible to translate into Italian.

GENERAL GRAMMAR

General linguists who tend toward structuralism build up language or speech as follows: (1) The foundation consists of phonology (sounds) or phonemes as the units of structure; (2) next a superstructure morphology, word forms in their various parts; and finally (3) syntax interrelationship of words to make sentences. This is a series of fixations and abstractions only remotely connected with referential behavior. What is primary for such linguists are vocalizations or complex sounds, rather than actual adjustments, because of the tradition of expressing ideas through sounds.

Undoubtedly language becomes fixated by repetition of references. A report of what someone says results in a description of the verbovocal performance, and hence a fixation of the linguistic adjustment. However, there is no similarity between the two. The reporter may insert several words where the original speaker said a simple "No." The complex adjustment may be described in widely varying styles. A humorous illustration is the joke of the Chinese witness in court. After a protracted statement, the judge asks the interpreter what he said; the interpreter replies, "He said 'no.' " The import of the speech is a simple declination or negation.

OTHER TYPES OF LINGUISTIC PRODUCTS

(A) WRITTEN OR TRANSCRIBED SPEECH

When persons learn to write, they fixate their own speech actions by recording them. Such fixations on a grand scale is perpetrated by anthropologists and missionaries when they report what people say. Their work results in the production of linguistic systems of objects. In general, however, the fixation process also can be effected by particular individuals. Individuals can speak either gesturally, vocally, or graphically, so transcription is readily available. If it is graphic to begin with, the behavior leaves a record. One writes a message and it can then be handled or transported like any other thing. 1) A refers to some thing or event, 2) the utterances may serve as a language product. 3) Then A or B may transcribe it in cursive form, after which 4) C can type it or 5) D can print it. These are primary, secondary, tertiary, etc., products.

(B) IDIOMATIC SPEECH

Another type of language things or products consist originally of authentic adjustments. Idiomatic speech is genuine action, but so restricted in pattern as to deserve the name of idiomatic things. The contrast between authentic spontaneous speech and the idiomatic action-products can be observed when those who study language from a book run up against the awkwardness and misunderstandings when they attempt to converse with native speakers.

(C) VERBAL FORMULAE

Word fixations like "Hi," "How do you do," "Morning," "Fine day," "Greetings," "Atta boy," "So long," etc., though they classify as psychological linguistic acts, are far from speech or referential behavior. They are as much derived from referential action as from verbal gestures, but still must be regarded as things.

(D) PROVERBS AND MAXIMS

These represent a regression from adjustments to things. They are embodied forms of action, which originally may have carried a message. "No use crying over spilt milk." Such words or statements later become standardized and repeated until they reached a crystallized stage. Spoken words are taken as things. After complete abstraction, the sounds become fixated and the field of behavior vanishes. The situation of original excitement, comfort, or admonishment is forgotten. By separating the sounds from the gestures, emotions, and general adjustment conditions, the formulae take on an independence and petrification.

(E) LITERARY TEXTS

In large part, the enormous holdings of books and manuscripts consist of linguistic things collected and stored for potential demand and use. This statement applies equally to the volume of stories, novels, epics, and all manner of Belles Lettres as well as to the book products in the fields of commerce, technology, education, science, and religion. Howsoever many problems that may arise concerning the techniques of production or the circumstances attending the origin of the many sacred, plain literary, and technical works, they all have some remote derivation from either or both referential and symbolic sources.

An interesting problem of production detail concerns the authorship of certain literary classics. Was it a man, or a woman called Homer, who composed the Odyssey and Iliad, or are they precipitations of the folk tales of generations? Similar questions are asked about many other language things, especially the sacred books of the various religions.

(F) SYMBOLIC SYSTEMS

Without any doubt, the most typical of all language fixations are the propositions of logic and the general systems of symbolic logic. The evidence for the close relationships of linguistic fixations and logical systems is clear when we consider the history of logic as a professional activity.

When we examine the work of Aristotle (384–322 B.C.) as the eminent formulator of a logical system, we find him constructing series of propositions which through fixation processes attain to universality, generality, and stability. In the case of symbolic systems, the fixation technique is readily analyzed. By means of transfixing sentences or statements, systems are created which point to and embody knowledge and truth. The primary result is the construction of propositions that are independent of specific unit events, but which in interrelation can control and validate descriptions of particular occurrences.

In order to follow through the formalization process of symbolic systems, consider the famous syllogism, "All men are mortal; Socrates is a man; therefore, Socrates is mortal." Such propositions originate as definite references to actual happenings. Then the statements or sentences are generalized and formalized in syllogistic systems with the absorption of the actual events. Sentences become propositions and premises in the syllogistic system. The thinghood of language is established already at the sentence stage since sentences are arbitrarily produced things, which are superimposed upon veritable speech.

When St. John wrote "In the beginning was the word," etc., he produced a complex word thing with no truly referential basis. This is a direct production of linguistic things, but there is little difference in such products from those referentially derived propositions. Modern logicians define and say, "Logic is the syntax of language." Syntax, they define as processes of formation and transformation of language, as though language were a set of boards, and logic a branch of carpentry.

It is an interesting circumstance that logicians have criticized the language things that have originated in referential and descriptive speech. Syllogisms, they say, are tautological and do not yield new information. Accordingly, an alleged improvement has been unknowingly proposed to base logic upon nonreferential language in the form of pure symbols derived from mathematical models. The replacement for syllogisms is the proposition P implies Q. An illustrative example is that the truth of P implies a true Q, while a false P implies any proposition one can set up, such as, "Napoleon was President of the U.S.A." The *Principia Mathematica* of Whitehead (1861–1947) and Russell (1872–1970) is a monumental system based on linguistic things.

(G) SCIENTIFIC DESCRIPTION

Among the most important and utilitarian examples of linguistic things are the terms and descriptive propositions and formulae of science. Scientific work in its various phases is closely interrelated with linguistic behavior, both referential and nonreferential. In the observational and experimental stages, formulations of hypotheses are basic as guides to contacts with particular classes of events. Then, of course, there are descriptions and records of the items studied to be followed by explanations and interpretations.

Often the scientists must invent their own symbols, for example, a cgs system (centimeter, gram, second). More specifically, the physicist employs particular mathematical models to represent events, as for example, a harmonic formula for vibrations, exponentials for cooling, and squares of times for falling bodies. The most telling thing-aspect of scientific description is available in the identification of such linguistic descriptions with the events described, as in the assertion that physics is the *Handbook of Physics*.

A still more palpable illustration of language things is available in the consideration of Euclidean geometry. The basic abstractions are points and lines substituting for positions and relations between them. But though the primary terms concern external metaphorical references to actual things, once they are constructed they stand

on their own feet. Dimensionless points produce lines even of infinite extension, and lines joined together constitute planes. Yet much value is lent to the shadows of the shadows of things when the system is made to serve useful purposes in concrete situations.

How thing language evolved is reflected in the career of science since the Middle Ages. The highest guides of learning consisted of memorizing texts compiled by the experts on ancient wisdom. Those texts were in the main remote from actual things and events. But symbols and descriptive constructions could evolve in close connection with authentic happenings as processes of observation, counting, measuring, and referring and describing. From the earliest development by Homo Sapiens of speech, carving, painting, finally arose every possible type of linguistic product, science, literature, symbology, system making, and so on.

Section Three

THE PSYCHOLOGICAL VARIABLES IN LINGUISTIC FIELDS

Chapter XII

Attending Behavior in Linguistic Fields

ATTENDING ACTION PRELIMINARY TO FURTHER BEHAVIOR

In the preceeding chapters, we have indicated the invariable place that attentional acts occupy in segments of behavior or psychological behavior fields. It is the attention reaction systems which precede and pave the way for the perceiving response system, which itself precedes every consummatory phase of behavior segments. In the present chapter we consider the operation of attentional reaction systems in linguistic adjustment fields.

ATTENTIONAL BEHAVIOR AS THE ACTUALIZATION OF STIMULUS FUNCTIONS

Attending behavior in linguistic fields constitute particular instances of attending in every behavior field. Accordingly, it is desirable to probe a bit further into the general behavior of individuals as they adapt themselves to their ambience of stimulus objects.

Before the individual can perform a particular action, he must perforce actualize a stimulus function inherent in some object or situation. Always individuals are surrounded by very many objects, to which they have previously reacted and thereby have built up in them stimulus functions. If they have not built up such functions in objects, they also do not perform any reactions to them so that such objects play no part in psychological situations. Now in the situation in which there are many stimulus objects around, the question arises as to with which one the individual will interact. There are many circumstances which favor the operation of a certain object at a particular time. For example, the movement or change in an object or organism, the strangeness of a stimulus object or situation, the interest of the reacting individual or his general behavioral equipment, each in its own way or in combination facilitates the actualization of stimulus functions. Examples are

easy to produce. No matter how preoccupied the individual is with some sort of work, a sudden clap of thunder will pull him away from his work, and he will interact with the thunder. In some cases perhaps it will be a simple act of identification that follows the actualization of the stimulus function of the object.

ATTENTIONAL THEORIES COMPARED

It is hardly necessary to add to the above exposition that it represents a full fledged naturalistic viewpoint. Therefore, it contrasts with other theories stemming from mind-body traditions. This contrast is worthy of some elaboration.

Throughout the entire mind-body tradition, attention is treated as a psychic process which made mental states clearer and more definite. Such "mental" processes were, of course, presumed to be accompanied by bodily processes, movements, strains, and so on. As to the objects attended to, they were regarded as sensations or psychic representations in the minds of attending organisms.

What is important to note here is the grand departure of mentalistic psychologists from the clear-cut fact that attentional behavior concerns modes of interaction of organisms with spatio-temporal objects like themselves. Accordingly, mentalistic psychologists could differ as to how the attentional process could affect the intensification of the stimulus that gives rise to the mental states. Some hold that sensations are intensified when they are already moderately intense, whereas others attribute this condition only to weak sensations.[1] All of the variations of psychical views are agreed upon the intermixture of objects, stimulating energies, and psychic states.

Not all mentalistic psychologists accept the view that the "mind" consists of detached and associated "sensations." For many the "mind" comprises only unified mental configurations or gestalten. Thus for them, attention does not concern the clarification of sensations, but the clarification of phenomenological objects. To attend to the figure rather than its ground is to vivify or clarify that, whereas if the ground is attended to, it is the background of the figure that is made alive and important.

[1] For a detailed treatment of the early psychic type of attention, see Pillsbury, W. B., *Attention*, New York: Macmillan, 1908.

No limit is set by the mentalistic framework to the variations of terms used to describe the effects of attending behavior. A recent suggestion favors the word "distinctiveness" as an improvement upon the two formerly frequently used terms, clearness and vividness.

Careful consideration of the actual behavior involved in attending to objects in their various settings not only invalidates the mentalistic terminology as technical descriptions, but also the entire viewpoint. Surely, there is no merit in the view that stimuli for psychological interactions consist of various indifferent energies coming into contact with special end organs or receptors with a consequent construction of objects in a nonexisting mind.

ATTENDING BEHAVIOR IN LINGUISTIC STUDIES

We turn now to the attentional functions in linguistic situations. An important attentional process is the actualization of the target of address when a number of persons are present. Thus when A speaks, B, C, and others must be aware that it is D who is being spoken to.

A most interesting attentional situation arises when one is first confronted by foreign speech. It is impossible to attend to it except as a great mass of indistinct noise. This situation has been well described by Stevens (1906–1973) who was sent as a Mormon missionary to Belgium without knowing a word of French. As he describes the situation it was "sometime near the end of the third month, that chattering, machine-gun language called French, which had been going by in a staccato blur, began to break up into words. A cloud was lifting." [2]

Only when one is familiar with a language system will the great mass of sound be actualized into separate referential units with their various specific functions. The difference between the two situations marks the period when many successive language adjustments have taken place such that utterances and their units take on specific functions.[3] Of course, the association of utterances with active referent objects are important factors.

[2] Stevens, S. S., Notes for a Life Story, in Lindzey, G. (ed.), *History of Psychology in Autobiography*, New York: McGraw-Hill, 1970.

[3] For native Japanese speakers, the sounds "ra" and "la" possess the same stimulus function.

Once an individual becomes proficient in performing linguistic behavior he will be able to actualize the whole or parts of utterances as specific stimulus objects, but he will not necessarily have to attend to every item of the utterance, which may be a lengthy segment of speech. This is the case because the essential guide in what the hearer does is the referent to which the speaker's utterances refer. If the utterances are conventional words and sentences, it will not be necessary for the hearer to actualize every sound, phoneme, or word.

Chapter XIII

Perceiving Behavior in Linguistic Fields

ORIENTING PROCESSES FOLLOWING ATTENDING

In all psychological fields, perceiving acts invariably follow attentional selection of stimulus functions. This is certainly the case in both the hearing and speaking phases of linguistic behavior segments. The speaker or referor performs perceiving behavior in intimate connection with referent objects and events as well as with definite reference to the hearer. Many visual and auditory responses operate during the initiatory phases of linguistic behavior. Probably most referential language behavior is preceded by seeing the things and events about which one speaks or hearing something about them. Similar functions are performed by other sensory or implicit encounters with such objects as the odors of flowers or gases in general, as well as the tactile, warmth, and cold conditions prevailing at the time of behavior.

On the side of hearers there are above all the auditory responses to the utterances of the speakers and the visual response to referents, or things seen as in the case of reading behavior. In all cases we have to distinguish between the utterance as speech, that is, message, question, information, or command, and the actual configuration of the utterance, that is, the words uttered and gestures performed. This fact is illustrated by the situation in which listening performances may be quite exact, though the utterances vary greatly. For example, if the speaker happens to be a person coming from a different dialectal zone, the hearer may or may not have any difficulty in appreciating the relationship of the reference and the referent.

Passing beyond the initiation stage of language fields there are innumerable sensory or perceptual reactions within speaking and hearing situations. These specific responses naturally vary with the characteristics of the fields. Speakers and hearers adjust themselves to the variations of the time, place, and identity of the person or

persons spoken or listened to. Such sensory or perceptual factors influence the style and flow of language performances.

Now although we have so far yielded to the convenience of featuring speaking or referential language we must pause to make clear that all we have said applies equally to the nonreferential or symbolic type of linguistic interbehavior. Naturally, there are numerous detailed differences in the two behavioral fields, but they are incidental by comparison with the common factors analyzable out of the two types of interbehavior. We turn next to a brief analysis of perceptual behavior.

THE NATURE OF PERCEIVING BEHAVIOR

Basically perceiving behavior consists of preliminary responses to things and events which serve to orient organisms with respect to their characteristics and functions. In a sense, then, perceiving serves to influence and control what the organism does subsequently.

Perceiving behaviors thus are definite interbehavioral acts which develop within the interbehavioral history of organisms. It is the development of perceiving responses which aid in the performance and perfection of behavioral adjustments. They make possible correctness of answers to questions as well as the suitability of references to things and to situations spoken of.

It is implied in this sketchy statement that perceiving reactions are important features in the ecological relationships of organisms and their environs. Contrary to the historical and conventional view that perceiving involves the creation of the qualities of things that have no objective and independent existence outside the "mind" the fact is that perceiving behavior is above all adjustmental by way of identifying objects in the surroundings. Not only is such an objective and naturalistic interpretation of perceiving behavior opposed to the perpetuation of traditional animism but it is equally free from the imaginary neurology which is only disguised animism.

Perceiving behavior should not be confused with acts of understanding.[1] The latter has to do with the building up of numerous responses which form the basis for evaluating things and events as

[1] See Chap. XV.

well as for such intimate orientation as to be familiar with their development, operation, and future transformations. To understand events is to be able to prognosticate or predict what they will do under various known conditions. Perceiving is much simpler than understanding, which is quite complex, and is perhaps most available when one hears a foreign language spoken. Understanding behavior may be regarded as a superior type of action concerned mainly with complex referents, for example, when the speaker discusses some intricate problem that is new or partially unknown to the listener.

NATURALISTIC VS. ANIMISTIC PERCEIVING

Perceiving as naturalistic adjustments can easily be differentiated from the traditional interpretations. The former begins with the observation that organisms adapt themselves to objects with certain properties inhering in them or attributed to them because of definite spatio-temporal conditions. The organism discovers these qualities or properties through numerous contacts with these objects. Henceforth, the organism merely discriminates or differentiates such objects as guides to further contacts with them. Fig. 3 on page 48 indicates the primary features of such confrontations of organisms with objects.

By contrast, the animistic interpretation of perceiving is based on the abstractive visual model in which not objects but light rays are the stimuli. Such rays are presumed to set up neurological processes in the retina which when conducted to certain parts of the brain produce visual qualities. These are compounded with other mental qualities and finally projected to the source of stimulation as an object. The entire model adopted as the basis of this perceptual interpretation stems from the early spectrum-producing manipulations of Newton with glass prisms.[2] It may be effectively represented by the diagram in Fig. 23.

PERCEIVING BEHAVIOR IN LANGUAGE SITUATIONS

As in all psychological adjustment situations, linguistic behavior involves a definite orientation to various objects and conditions

[2] See Kantor, J. R., Newton's Influence on the Development of Psychology, *Psychological Record*, 1970, 20, 83–92.

in the environs. Thus a speaker who says, "Please hand me the book" does so because he is in need of it, and expects the referee to be able to identify it and its location. When he says, "Where is the book?" he is oriented to its absence. Such illustrations reflect the immense number of perceiving adjustments. The perceptual phase of hearing and reading language are more apparent to the

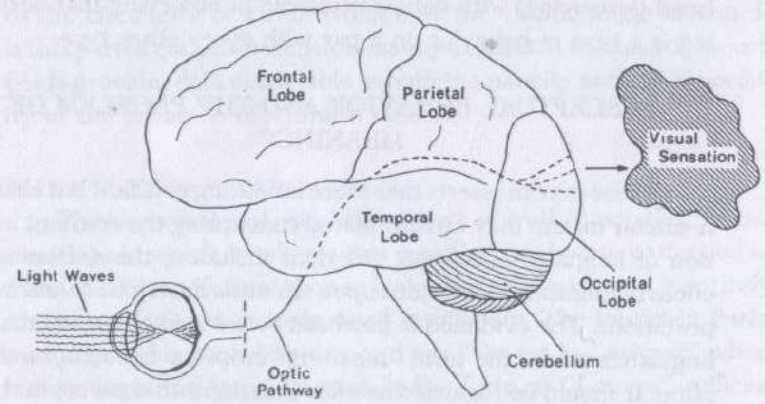


Fig. 23. The misleading Newtonian Model of Visual Perceiving.

casual observer than that of the speech phase. To begin with, the hearer identifies the utterance of the speaker as, for example, English or French, or as a dialect of a particular language. Then he must perceive that a certain book is the desired one, which he should hand to the speaker.

THE ORIENTATIONAL VARIATION IN PERCEIVING ACTS

Perceiving behavior naturally varies greatly in different language situations. Some situations require only the barest identification by the referee of the nature of the stimulation presented by the referor. Others are more complicated and involve more elaborate orientation. Below we indicate four different types of perceiving behavior based upon the linguistic performance of speaker and listener, plus the setting factors and the relation of speech behavior to other acts.

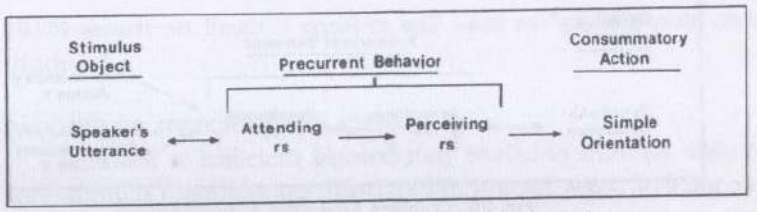


Fig. 24. Primary Perceiving in Linguistic Behavior.

PRIMARY PERCEIVING

The most elementary linguistic perceiving concerns the simple hearing or listening action that discriminates between one kind of reference and another, whether an utterance belongs to the listener's language community or not. The behavior of the referee simply becomes aware of what the referor says, but there is no further action to perform with respect to the referent. Fig. 24 illustrates this type of perceiving.

SIMPLE APPREHENSION

This type of linguistic perceiving involves a simple intimation concerning a post linguistic behavior segment. The speaker's utterance, "go home," "come here," is apprehended and followed. See diagram in Fig. 25.

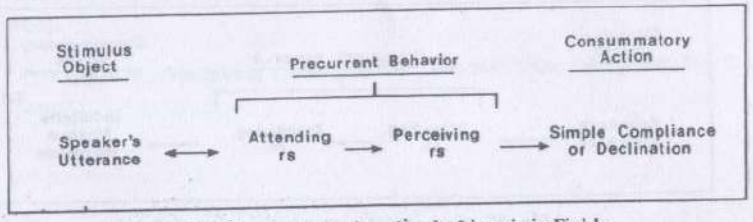


Fig. 25. Simple Apprehension in Linguistic Fields.

COMPLEX APPREHENSION

"Help yourself," says X, presenting a bowl of fruit to a visitor. In this case, the speaker's utterance stimulates a more elaborate form of orientation and a very effective reference to the referent, since each kind of fruit is agreeable to the listener. Taking one kind and not another is at the same time a positive and negative performance, that is, involves a choosing act. This situation is represented in Fig. 26.

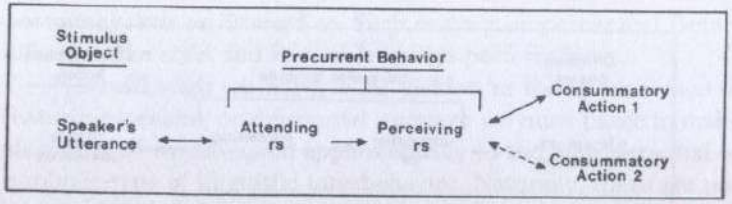


Fig. 26. Complex Linguistic Apprehension.

COMPREHENSION

By far the most orientative of the perceiving types of behavior are the comprehending class. They are confined to linguistic situations with complex references and referents. In such linguistic situations the question arises as to what is the precise significance of what is said. The listener hears or the reader sees the statement "the response is a function of the exponent of the stimulation," and must match it to the referent.

Perceptual comprehension approaches intellectual understanding behavior with the difference that the former involves direct contact with stimulus objects, while the latter does not. On the whole there is a lesser probability that perceptual comprehension might involve fewer doubts and misinterpretations of identity. The diagram of Fig. 27 suggests this type of interbehavior.

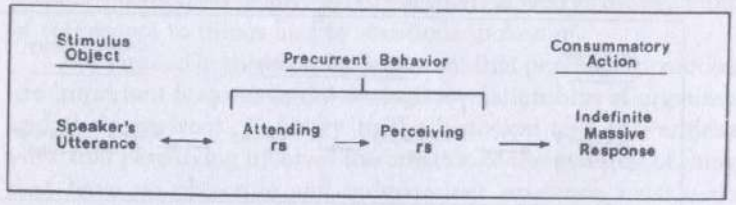


Fig. 27. Complex Linguistic Comprehension.

MISCONCEPTIONS CONCERNING PERCEPTUAL BEHAVIOR

The present discussion of perceptual behavior should make clear that such adjustments are definitely occurring features of linguistic events under all circumstances and under all auspices. Yet there are serious misunderstandings concerning perceiving among not only linguists but psychologists as well.

Briefly put, scholars of all persuasions assume that perceiving behavior consists of internal states and not types of objective behavior on the part of organisms of every level of evolution. It is only the perseveration of mentalistic presuppositions that make such views palatable. How damaging this sort of misconception and confusion is may be estimated from the fact that even scholars who are sympathetic to scientific psychology persist in coupling perception (read perceiving) with behavior instead of observing that perceiving is a type of behavior on a par with every other type.

PERCEPTUAL BEHAVIOR AND THE PROBLEM OF MEANINGS

A wise maxim asserts that there is nothing constant but change. A similar maxim may be formulated concerning the constant intrusion of language in human situations including the sinister influences of linguistic institutions upon scientific descriptions and interpretations. The evidence is nowhere better demonstrated than in linguistics where the term "meaning" crops up to corrupt a discipline. It should be regarded as a fair statement that perceptual acts operate to differentiate and point out the meanings of uttered sounds and sentences. But so powerful are the historical mentalistic traditions in psychology that the term suggests some nonexisting power or process, whereas it should refer only to the actual usage of terms in linguistic adjustments.

THE PLACE OF PERCEIVING IN COMMUNICATIVE SITUATIONS

Perceiving is an invariable component of all linguistic situations. But what follows this component of behavior segments differs markedly in various speech circumstances. For example, in certain situations the perceiving of speech stimulation may be followed merely by orientation or nonorientation. The latter is the case while listening to an intricate lecture or to a command in an unfamiliar situation. In other circumstances the perceiving act is followed by some overt performance as indicated by the request or command of the referor. The range of sequelae of perceiving functions is as great as the wide range of linguistic events.

UNIQUE FEATURES OF SPEECH FIELDS

Perceiving acts as components of behavior segments comport with the general rule of perceiving acts as being partially implicit, that is, the reacting organism is not completely in contact with the stimulus object. Examples are the situations in which one reacts to a cube though only the front surface is available, or the reaction to the circularity of a coin when only the elliptic angle is seen. It is this partial contact with stimulus objects that in the case of speech fields provides data classifiable as both the paucity and the superfluity of the presence of stimulus objects.

SUPERFLUITY IN SPEECH

The superfluity of stimulus objects is well illustrated by the situations in which speakers utter complete sentences patterned as standard literary forms when in fact much of what is said is entirely unnecessary. Often a single word is sufficient. The tourist in Paris, may repeat his book learning and say "Ou est la Louvre?" when just an inquiring vocal gesture in the form of "Louvre" suffices. Similarly, the referee's elaborate directions serve no better purpose when the single pointing gesture is enough.

The general linguist offers interesting examples of linguistic superfluity from the phonetic and phonemic domain. Bloomfield (1887–1949) [3] points out that an English speaker does not hear or react to the Menomini's different utterances of a kah = yes, ahkah = kettle, or the first part of the word akahsemen = plum, since the first word includes a glottal stop and the second an aspiration not present in English. The same writer similarly points out that for a Menomini the difference between English "t" and "d" is superfluous though similar sounds might be present in some utterances. It is, of course, common knowledge that for nonnative speakers of English the distinction between "t" and "th" is not perceived and hence superfluous.

An interesting counter condition to the nonperceiving of sound utterances is perceiving more than is suggested in the stimulus object. An excellent example is the set of meaningless French words "pas de lieu Rhône que nous," which William James (1842–1910) asserts an English speaker will hear as "paddle your own canoe." [4]

[3] Bloomfield, L., *Language*, New York: Holt, 1933, p. 82.

PAUCITY OF SPEECH STIMULATION

The lack of sufficient immediately available stimulus objects and stimulus functions are illustrated in several ways. Striking examples are the incompatability of the speech utterances with the hearer's perceptual capacity. Utterances are mumbled, too shrill, or distorted. The speech of foreigners may be too heavily charged with masking accent. Again in the same system difficulties may arise for the listener in the substitution of words, spanner for wrench, mud guard for fender, screen for shield, and so on. More extreme examples are manual gesturing instead of sound uttering in any language.

It is a permissible generalization that both the paucity and superfluity of speech may be accounted for on the ground that speech is a dramatic type of adjustment. The perceptive components are conditioned by the fact that all the component items in the behavior fields need only be well enough integrated in specific adjustmental situations. In many circumstances, very little need be said since the setting factors in psychological fields exert a great influence upon the interbehavior of individuals with stimulus objects.

[4] James, W., *Principles of Psychology*, New York: Holt, 1890, Vol. I p. 442; Vol. II p. 80.

Chapter XIV

Memorial Aspects of Linguistic Fields

MEMORIAL BEHAVIOR AS AIDS IN SPEECH

Remembering and forgetting have long been regarded as intimately involved in linguistic fields. As far back as the 17th century John Wilkins (1614–1672) indicated how important the "Art of Memory" is for speech and language.[1] In general, linguistic behavior and linguistic situations are the fertile sources of numerous problems concerning remembering and forgetting. A typical issue is the mystery as to how speakers and hearers can entertain all the words, phrases, and sentences, that they utter or hear in conversation or simple communication. One of the most widely held views is that individuals simply remember to perform, or forget to perform, the referential actions involved in speaking or hearing. This view, unfortunately, reveals completely erroneous notions of both language and remembering behavior. The performance of language actions is no more a matter of remembering than are the periodic acts of walking, chewing, or reflexly warding off a blow. It is our task in this chapter, therefore, to clarify the nature of remembering and its operation in linguistic situations. We examine briefly the exact nature of remembering and related types of behavior which have been indiscriminantly grouped together under the category of "memory."

THE PSYCHOLOGY OF REMEMBERING AND RELATED BEHAVIOR

REMEMBERING

Authentic remembering constitutes a psychological field comprising three phases: (1) the projection of some act into the future by agreeing to do something after a lapse of time. Depending upon specific situations, this projection consists of establishing a particular kind of substitute stimulus—marking a calendar, writing a memorandum, and by many other means. Phase (2) is simply a waiting period until the proper time for the projected action to be performed. This phase of the memorial field involves contact with the substitute stimulus object. The final phase (3) consists of carrying out the projected action as a consummation of the remembering behavior fields. Keeping before us the nature of remembering and keeping alert to the actual situation in which speech behavior occurs, we must exclude a remembering process as a factor of referential acts when certain events occur.

[1] Wilkins, J., *An Essay Towards a Real Character and a Philosophical Language*, London: Gellibrant, 1668.

FORGETTING

Since remembering involves a proposed act and a postponement period, there is frequently a possibility of a nonoccurrence of the consummatory phase of the remembering event. That is forgetting. Basically, forgetting is well described as a failure of contact between the individual and the substitute stimulus. The required substitute object may be out of reach or lost, or the person becomes preoccupied in other activities involving different kinds of stimulus objects.

What induces writers wrongly to connect remembering with speech is the confusion of different situations as though they were identical. For example, there is the process of casually reminiscing about a conversation that one has participated in or overheard sometime in the past. Or there is the process of direct recollection of a conversation as when a witness is required to explain what went on linguistically, as between the plaintiff and some other person. But what are mainly confused are the development of speech performance memorization processes with the triphase process of remembering. We turn now to describe memorization and indicate the basis for the confusions.

MEMORIZATION

This form of communication behavior consists primarily of building up short term referential habits by more or less frequently performing verbovocal or other forms of action while interbehaving with stimulus objects which may be themselves acts of the speaker or other persons. In the present context, memorization is

a specialized type of individual behavior development comparable to the evolution of personality equipment under particular circumstances. Obvious examples are the memorization of verses for later recitation, and assimilating the formula "ic to ate and ous to ite" for dealing with the reactions of acids in forming salts. (Examples: $2K_2CrO_4 + H_2SO_4 \rightarrow K_2SO_4 + H_2O + K_2CrO_7$; $HNO_2 + NaOH \rightarrow NaNO_2$.) It is this memorial aspect that is mainly involved in such speech situations as the early stages of developing facility in speaking a foreign language, while authentic remembering plays hardly any part at all.

REMINISCING

Essentially, reminiscing is a subtle form of implicit action with respect to past events. Through substitute stimuli the person is enabled to react to situations long since lost in the indefinite past, whether for pleasure and amusement or some more serious preoccupation. Of the several types of reacting to past situations, the kind called "determined recollection" is of some linguistic importance as, for example, in "recalling" how the Chinese speak of haste.

CONVENTIONAL ERRORS CONCERNING SPEECH CAPACITIES AND SPEECH PERFORMANCES

Speaking capacity and speaking performances are both based upon the complex process of developing responses in reciprocal connection with the two other factors in referential behavior fields. The indefinitely large number of speech performances are acquired responses like any manipulative or gestural action. They are adaptations built up in specific kinds of situations.

Outstanding among the fallacious notions concerning the remembering of words or systems of words in syntactical structures are such beliefs as the mythical notion that words somehow are stored in "memory." Of course, there is no such storage and there is no such locus for storage. All assertions about storage in the brain are purely mythical.

Students of general linguistics who are interested in the development of language in infants and children attempt to account for the capacity to form sentences out of words, but completely misinterpret what the psychologist knows about the development of speech performance behavior. In general, the behavior segments involved in speech or language are developed in intimate interconnection with stimulus objects, persons, and particular kinds of situations. On the side of the individual, there are many forms of adjustment which characterize the person as a specific personality. Just as he develops capacities for adjusting to all kinds of stimulus objects that he sees, manipulates, or destroys, so he builds up a tremendous number of linguoecological adjustments.

Linguists specializing in studies of grammar invent all sorts of puzzles as to the capability of children to form sentences. So far they go as to invent native or inherited potentialities to combine words in sentences. They overlook completely that the situation and setting control the organization of what they call a sentence, but which is, rather, a linguistic response.[2] When A sees someone, say a farmer, killing a pig, what else could the reporter of the scene say than "the farmer kills a pig." [3] It would be impossible for a normal speaker to describe the situation referred to as "the pig kills the farmer." [4]

PSYCHOLOGY OF CAPACITIES AND PERFORMANCE

If any branch of linguistics is to be numbered among the sciences, it must conform to the axioms of psychological science. That signifies essentially that it must avoid the venerable notions of soul or self as an entity located in or paralleling the observable interactions of organisms. In this section we consider several problems that exhibit the contrast between psychology as a theological discipline and as a scientific system.

CAPACITIES AS FACULTIES AND AS PERFORMANCE

Conspicuous in the general linguistic field is the assumption that speaking is the exercise of a faculty that inheres in a mind, soul, or self. At best the holders of such views think in terms of vague potentiality resident in mental entities. This sort of view clashes with the facts that there is no such entity as a mind, even a brain-

[2] The self-styled transformationists and generative syntactical grammarians.
[3] In whatever style it may be.
[4] Of course, the killing process has many variations.

mind, and that speaking is a definite kind of adaptation of persons to actual situations. Scientifically there is no difference between capacities and performances except as to time of occurrence. It is permissible to refer to potential speech as latent but only in the sense that some factors are lacking that are necessary for the completion of a linguistic field. Speech capacities are names given to language utterances or performances when speakers are in the presence of certain events plus persons to be told about it.

GENETIC FACTORS IN SPEECH

The mind or self as entity discloses itself in the insistence that there is a genetic or innate factor in psychological performances including speech. Despite the obvious facts of the development of language in childhood and adulthood writers on linguistics insist upon some innate principle. True it is, of course, that only organisms that have evolved to do so perform language behavior but evolution is a precise set of events, interactions indeed, and not some esoteric or invented principle. Genetic factors as actual interactional processes of cells or organisms with inevitably environing things and conditions are remote from the specific circumstances that make referential and symbolic behavior possible and actual when occasions arise.

PSYCHOLOGICAL ADAPTATION AND LANGUAGE

Biological and psychological events much more than the events of physics show the process of adaptation. Gravitation and hysterisis are striking examples of interbehavioral fields, but they are not as intimate and common as the interrelatedness of behavior with ambient conditions, as in growth, immunity, regeneration, and the adaptabilities of biology and psychology. For one thing the temporality and immediacy are not so evident in the nonbiological and nonpsychological realms.

Chapter XV

Understanding and Its Role in Language Situations

UNDERSTANDING AS A FOUNDATION OF SPEECH

The psychological process of understanding occupies an important position in linguistic situations. Obviously, one cannot participate in conversation or other linguistic behavior unless one has built up a capacity for understanding what is being said or pointed out. This is true even when the language activity consists of unique types of gestures. Probably the best way of envisaging understanding is to consider it as an ability to interact in various specific fields. Such fields are generated when objects and conditions have taken on stimulational functions, so that the person who understands some thing or situation can perform proper actions with respect to the presently confronted stimulus objects. Understanding is especially important for language, since the hearing phase consists of interbehavior with referents and not merely the identification and appreciation of the utterances of the speaker. Thus a clear differentiation marks off the acts of simple hearing from the more complex response of understanding something about the referent.

An interesting and important circumstance concerning psychological understanding in linguistic situations is that the reacting person is definitely aware of the referent. Despite many imperfections in the reference, a passenger riding in a bus with limited hearing ability or imperfect pronunciation by the conductor can still understand what the conductor is saying if he knows the location of the bus with respect to particular streets. Of course, the outer boundary of the situation is being aware of some indicator of what street is being passed at the particular moment. In other words, no utterance by the conductor is necessary at all. However, the passenger may be only slightly acquainted with the immediate location of the bus and so even the imperfectly enunciated announcement is understood. On the other hand, the stranger who is not familiar with the route of the bus and the street passed over

may require very clear enunciation as though he were reading off the names of the streets in clear letters.

HOW UNDERSTANDING REACTIONS OPERATE IN LINGUISTIC SITUATIONS

The obvious instance of understanding in linguistic situations appears overwhelming when we consider how most persons are imprisoned in the stockade of their own group language. Unilingual individuals may be more or less capable and even proficient in intercommunicating with others sharing the same language system but they are completely mute when in contact with speakers and the speech of other language systems. Moreover, within a single complex language community there are numerous barriers to understanding on the ground of social and economic class, educational level, and vocational experience. We may, then, conclude that psychological processes of understanding are of crucial significance in linguistic situations.

From another angle the importance of understanding for language stands out because of the intimate relationship between understanding reactions and the problems of linguistic meaning. There can be no intercommunication between individuals unless they understand the meanings of each other's utterances or other types of linguistic reactions. They may see or hear what has been written or said but unless they understand the writing or speaking there is no appropriate linguistic performance on the part of the referee.

Significant illustrations of efficient understanding are found in the situation in which the referee can read between the lines, or what is behind utterances. It is a superior form of linguistic understanding when the referee can discern the intrinsic meaning of the referor when he knows that "no" means "yes," or "yes" means "maybe" or "no." "I do not choose to run" when uttered by a politician is not really understood except by the referee who knows the nature and record of the speaker, or the conditions that might alter his attitude.

Those who understand the speaker as well as the speech can judge whether the utterances are performed to conceal intentions,

make a joke, or decide that there is no event that is verbally referred to. It is understanding behavior that makes possible the discerning of nuances of reference whether verbovocal, gestural, or some other sort, and in general why the speaker says what he does.

Although we have stressed the understanding feature of language as primarily an action on the part of the referee, it is certainly not excluded from the behavior of the speaker. But, of course, the focus is different. The referor must be oriented with respect to the linguistic system the referee understands, the dialectical system he belongs to, the type of referent he might know about on the basis of his education and present occupation. Should there be gross inequalities between the two protagonists in the linguistic field, minor and serious circumstances might arise to interfere with the orderly processes of language events.

PSYCHOLOGY OF LINGUISTIC MEANING AND UNDERSTANDING

At this point the reader hardly needs to be reminded of the vast contrast that exists between the conventional psychology of mind and the insights provided by an examination of the behavior of persons in concrete linguistic fields. What is required, then, is only to relate meanings and understanding data to other forms of psychological fields.

Understanding behavior constitutes one of two species of orientational behavior, the other of which is knowing. Orientational behavior contrasts with immediately performative action, although it may be closely associated with performative action. It is this intimacy of association with performatory action which is the criterion for differentiating meaning from knowing. Meaning behavior stands between perceiving as the identifying and somewhat evaluating reaction to stimulus objects, and the more or less purely orientative behavior of knowing reactions. The latter type of behavior may stand completely isolated from any further action, whether performative or orientational.

Meanings in linguistic fields are well illustrated by the reactions performed by referees to the utterance, "Close the door," "Turn

off the light," "Put the mop away." Such utterances are definite means toward carrying out the commands or countering with the utterance, "Do it yourself."

Understanding reactions on the other hand are also exemplified by such references as "Mr. X has just been here," "The vapor tension of water at 20° Centigrade is 17.4 millimeters," or "The population of Mandalay is close to 200,000." No visible performance need follow the orientation which may or may not be exact.

Linguistic understanding is essentially a matter of a listener or referee being effectively oriented with respect to the referent. Unless he is, there can be no proper compliance or noncompliance with the request or demand of the speaker and hence no orderly interpersonal adjustments, as between speaker and hearer. There are situations, of course, in which a great gulf may exist, as between the behavior of a referor and referee. Examples in profusion are available from the domains of literature, science, politics, religion, and the law. Referees may perceive precisely what the referor or symbolizer utters or sets down, but how he understands the message or reference may differ enormously, even to the point of minimal or no understanding.

LITERARY AMBIGUITIES

Within the literary domain, probably the most acute problems of possible incoordination of reference and understanding center in questions of translation. While the incompatabilities of various language systems loom larger than merely the quality of understanding, there are still problems of matching utterances with orientations. In attempting to translate from one system into another, one faces the question of the identity of the referent. This is probably because the referents consist more of human behavior than the more stable things and events studied by scientists.

SCIENTIFIC PRECISION

Scientists who look upon mathematics as a language strive to leave no gap between what is asserted and what is to be understood. Certainly, exact relational statements are superior to verbal descriptions made up of generally polysymous words. The understanding of the references is common and precise for all those who are familiar with the quantizational form of communication.

POLITICAL DOUBLETALK

In the political realm, the candidate for office repeats his promises of riches and reforms, but only those who stay to listen will misunderstand that all it signifies is "I want to be elected." They have all been through political situations before and know that even sincere and well-intentioned promises are subject to the accidents of social and economic eventualities and contingencies as well as international relations.

RELIGIOUS INTERPRETATION

An unorthodox seminarist, being asked how he can function as a shepherd to his flock, answered, "When I speak of God the members of the congregation may interpret what I say as they can within their beliefs and understanding, while I will be referring to something altogether different, for example, the highest social values."

LEGAL ENIGMAS

When the question arises whether judges only assert what the law is, or actually create it, we have a clear case of a void between what is asserted and what is understood. The problem arises, what did the founding fathers declare in the constitution, and what did the legislators decree in the amendments? Did or did not "all men" include Amer-indians or Blacks? Hordes of lawyers are needed to decide how the spoken or written rules or declarations should be understood. No better examples of the enigmas localized in legal language need be sought than those localized in the and/or controversy.

Some judges accept the and/or expression as meaningful and appropriate when referring to joint tenancy in savings accounts, while others call it "gibberish," "linguistic abomination," and "verbal monstrosity." Those lawyers and judges who condemn the use of "and/or" insist that only "and" is the proper usage, and want

to banish the term "or" altogether from this specific type of legal language.

CONDITIONS FOR LINGUISTIC UNDERSTANDING

As in all cases of psychological interbehavior, linguistic understanding is facilitated or inhibited by a number of conditions centered in the organism, stimulus objects, and settings or auspices of the behavior segments. In the following paragraphs I list and describe some prominent items.

ADEQUATE REFERENCE AND REFEREE ACTION

It may be taken for granted that optimal linguistic interbehavior is a function of the adequacy of the general references or individuals. Speakers or writers must practice clarity of enunciation and transcription, while referees find their normality and acuity of vision and hearing of great benefit in interpersonal communication.

Similarly, linguistic intercommunication profits from a concinnity of status and interest on the part of the protagonists in dialogue or conversation. In every complex society there are inevitably linguistic group specializations. Many distinctive vocabularies exist with their bases in social classes, in educational groupings and in professional and vocational fraternities.

FAMILIARITY WITH REFERENT

Closely connected with the above are the specific conditions centered in the speech referents. The more familiar the referent factors are to both protagonists the easier and smoother is intercommunication. We have already referred to the circumstance that passengers familiar with the geography of the district passed through and the stations en route understand what the conductor announces despite the latter's poor enunication and the defects of the apparatus he uses, while a stranger finds himself at a loss.

A specialized instance of this type of condition is the awareness of the immediate context of utterances. Frequently a sudden change in topic of conversation interferes greatly with the understanding of what is being said.

COMPATABILITIES OF LANGUAGE SYSTEMS

Facilitating the understanding of audiovocal speech is the compatability of language systems. It matters little that the Frenchman utters the sound "zis" when he wants to say "this" in English, but of course the variations of sound have to be known to the hearer. This signifies an amplification of the type of utterances in a language system. Not all such variations are assimilable.

Chapter XVI

Linguistic Participants in Intellectual Behavior Fields

LINGUISTIC BEHAVIOR SUPPORTS INTELLECTUAL ADJUSTMENTS

Throughout the ages observers have noted that linguistic behavior is intimately involved in the subtle performances of intellectual behavior such as thinking, reasoning, and general intellectual attitudinizing. And this despite the inept interpretations they placed upon the activities they witnessed.

The clue to the appreciation of the participation of language in intellectual fields is, of course, the fact that intellectual behavior consists predominantly of interbehaving with substitute stimulus objects, since reactions to directly confrontable things and events are not feasible or possible. Linguistic behavior exhibits excellent examples of the operation of substitute stimulations, though usually linguistic behavior occurs when the auxiliary stimulus object is another person, not infrequently the auxiliary stimulus function may be localized in the speaker himself. Accordingly, speech behavior as substitute stimulus and response plays an important part in such complex behavior as thinking and reasoning. We recall here the circumstance that thinking is the process of talking to oneself.

This participation of language is especially clear in acts of musing or day-dreaming, but it is the most serious of actions while solving problems and even more striking in performing the deepest reasoning about the most important matters. This is the case because linguistic behavior, whether verbal utterance or manual symbolization, can function as important auxiliary actions for complex thinking and reasoning adjustments. But now we must consider the nature of thinking and reasoning.

Thinking interbehavior is excellently exemplified by acts of planning, judging, evaluating, deciding, criticizing, and similar types of adjustments. It is easy to see, then, that vocal utterances

and manually produced symbols are important auxiliaries. For example, in planning one says to oneself or to someone else, "But I cannot do that," "That takes too long," I cannot afford that." There is hardly a limit to the amount and types of reference and symbolism required or preferred for carrying out the planning behavior. The same thing is true for all other types of action categorized by the term "thinking."

What is true of thinking is equally true of reasoning. Most of what is done under that description is certainly impossible of performance without language in some form. In the case of both thinking and reasoning, linguistic performances constitute the most effective ways of substituting for more direct actions.

Of course it must be realized that since the behavioral fields operating in such cases are hardly at all intercommunicative, only certain linguistic features, such as the symbolistic and verbovocal performances, are involved. Howsoever serviceable such auxiliary actions may be, they are only vestiges of authentic linguistic behavior segments. The strong points about such auxiliary actions are precisely that they participate in concrete interactions of individuals with objects and events, albeit in primarily implicit fashion.

Because of the ever-present and effective character of language in the complex behavior of humans, it is not surprising that linguistic behavior is sometimes confused with other kinds bearing some faint and remote resemblance to them. This is notably the case with intellectual behavior. In consequence it is necessary to distinguish language behavior from various types of intellectual activities, and to indicate the actual important interrelationships, both as aids and substitutes, that prevail between them. In order to do this it is imperative to identify and describe the primary types, namely, thinking, reasoning, and intellectual attitudes.

THINKING BEHAVIOR NOT IDENTICAL WITH LANGUAGE

Thinking behavior may be characterized as a variety of behavior segments or fields of action which constitute more or less subtle preparations for the future effective adjustments to a variety of objects or situations. A partial enumeration of types of thinking, for example, planning, choosing, evaluating, judging, analyzing, and criticizing, opens the way to an immediate appreciation of the kind

of adjustments they are, and the support they receive from language to facilitate their operation in all the many complex situations in which they occur. But language behavior is not thinking. The main characteristic of thinking behavior which promotes or at least supports a similarity to linguistic behavior is that they are implicit in the sense that they operate in the absence of their ordinary stimulus objects by means of substitute stimuli. This gives rise to the misinterpretation that they are indirect adjustments in the same sense as linguistic activities. Actually, of course, there are many bits of evidence to indicate the contrary.

To equate speaking with planning, analyzing, judging, predicting, or any or all of the diverse adjustments of persons to various situations is to overlook entirely the details of what the person does. To lump together such different activities is to blind oneself to easily observed differences of events. For one thing, typical language behavior is interpersonal, but the various thinking activities may have as stimuli nonhuman inorganic or organic things and events.

While it is undeniable that linguistic behavior is the most effective agent for carrying on thinking behavior of every sort and the most constantly interrelated with such other activities, there are other sorts of behavior which also are closely interconnected with thinking behavior. Obvious examples are the manipulation of maps, train, plane, and ship schedules, the construction of models of various sorts, the production of equations, diagrams, and other paraphernalia. Certainly, this fact should caution against any misinterpretation of such distinctive adjustmental activities.

It is a plausible belief that the confusion of such utterly different kinds of behavior is owing to the apparent indirectness of thinking. But nothing is more certain than the actual directness of thinking in its every form and instance. One must be alert to the invariable indirectness of language. Language of referential behavior, howsoever effective it may be in eventuating the manipulation or transformation of stimulus objects, is in itself not directly operative upon things. The speaker may produce momentous effects upon things but he will do so only through the directed exertions of others. We may add that the difference we are insisting upon is in no sense dependent upon any temporal gap between a request

or demand and its final execution. No, the differences inhere in the actual movements and contacts with stimulus objects.

A basic factor in the identification of speech and thinking undoubtedly lies in the adoption of traditional attitudes towards psychology. First, thinking and other intellectual activities are regarded as mental or subjective, and then by dint of dualistic axiomation are associated with palpable speaking action or writing. The classical example is the witting or unwitting association of sounds, words, and sentences with meaning. It is safe to say that linguists in general have no other notion of meaning than as some sort of nonspatiotemporal essence, instead of some definite behavior or product of interbehavior. It is the merit of observable and naturalistic psychology to insist upon the differentiation between specific adjustments of individuals and to record the variations and indicate the coincidental operations of the various sorts.

To ask why language has become identified with thinking is to inquire into the admirable urge to turn toward objectivity or naturalism in psychology. Psychologists interested in displacing psychic modes of interpreting complex behavior have hit upon the notion that thinking behavior in its various forms could be identified with speech and in fact with the action of the larynx.[1] However meritorious the intention is to dispense with mentalistic mythology the outcome is to misinterpret both thinking and language behavior.

REASONING INTERBEHAVIOR

The central core of reasoning is inferential action. Such action consists essentially of implicitly moving from one item of a system to one or more others. The conventional syllogism illustrates the process as it moves along from the premises to a conclusion. In general, referring or reasoning behavior may be described as interacting with abstractions, and not immediate manipulations or other performances. Surely verbovocal behavior is of the greatest auxiliary aid in performing all sorts of reasoning behavior, but such actions are not functionally linguistic and of course not entirely inferential. An extremely important feature of positive identification of language and reasoning is found in those situations in which

[1] As J. B. Watson once thought.

inferring processes are remote from actual confrontation of individuals with things and events contained in their surroundings. Systems of premises and conclusions may be autistically built up out of nothing but language elements. The best examples, of course, are found in religious and theological situations though they are not altogether lacking in other creative circumstances excepting scientific circles.

INTELLECTUAL ATTITUDES

Of all the associations between intellectual behavior and language, the greatest intimacy exists between linguistic events and intellectual attitudes. In fact, the connection is so close as to make tolerable the notion of complete identity though this is actually impossible. Intellectual attitudes are acts or adjustments of the individual in which a stance or position is taken with or without further performative action with respect to persons, things, or events. Typical intellectual attitudes may be named belief, opinions, suppositions, propositions, conjectures, guessing, and so on.

Behavior segments of the attitude type are such because the stimulus objects are vague, indeterminate, or difficult of access. Thus they are different from knowing reactions which constitute a definite orientation even if an inept or mistaken one. In themselves the responses are subtle and require considerable ingenuity for their observation and description.

So frequently are intellectual attitudes inappreciable that they may well appear as only the language in which they are made manifest. It is as though they can only exist in the linguistic references to them. But this should not mislead us to overlook the prevalence and power of such interbehaviors in complex human circumstances. Intellectual attitudes have sufficient and even great substantiality as interactions of persons with things and situations, but to be referred to, publicized, criticized, and evaluated, they must be linguistically treated or contextualized.

An excellent source of materials for the study of the intimate relations and the differences between intellectual attitudes and language is found in the consideration of scientific propositions. On the basis of observations scientific workers formulate propositions and subsequently interact with them in various ways. For example,

Galileo (1564–1642) concluded that the rate of fall of a body is a function of the space covered. Later he modified his view to the effect that the rate of fall is really a function of the time taken. This proposition is referred to and studied by means of the verbovocal utterance or its written representative $S = .5gt$.[2] Now to study Galileo's behavior throughout the process of reaching his preferred attitude toward events as substitutes for experiments is to be deeply impressed with the differences between the structure of propositions and the linguistic utterance or code in which they are embodied for various purposes. It should be added here that the dynamics observed and the formulae representing them may be more important than the attitude hit upon, but this is a matter additional to any linguistic problem. It may be that the proposition of a falling body being a function of space covered is as valid as the time function proposition, in view of the factuality of spacetime.

The general outcome of our brief consideration of the interrelation of language and intellectual behavior is to marvel at the potentialities of linguistic behavior for the performance of some of the most significant, though very different, behavior of human repertoires.[2]

[2] For a more comprehensive exposition of propositions see Kantor J. R., An Interbehavioral Analysis of Propositions, *Psychological Record*, 1943, 5 309–339.

Section Four

EVOLUTION OF LINGUISTIC BEHAVIOR

Chapter XVII

Origin and Development of Linguistic Behavior

LANGUAGE IN EVOLUTION

Since conventional linguistics is based upon the study of words and combinations of words in particular language systems, language has become a cultural institution, that is, an item of the social impedimenta of groups, similar to customs, ritual, law, social organization, ethical mores, and so on.

Language thus regarded has its uses and justification for general linguistic purposes; it does however involve a departure from the communication behavior of speech which undoubtedly constitutes the kernel of all language phenomena. Thus linguistic behavior has taken on the traits of things.

The history of linguistics indicates that many writers have speculated as to the origin of language institutions and they have invented a number of peculiar theories to explain the source of linguistic events. A prominent early example was the theory of Herder (1744–1803), who simply regarded speech as a gift of God. But other writers have provided similarly inept "explanations," most of which have presumably been based upon the observation of organisms performing action. For instance, one of the theories has held that speech imitates the actions of objects, for example, the barking of a dog, the sound of the wind, and so on. A number of equally implausible theories have been propounded. In none of them has there appeared to be any inkling of the facts of biological or cultural evolution.

It may be admitted that intriguing problems center around the development of language both as types of general systems of all human communities and as individual behavior under the auspices of the gregarious contingencies of human living. But there is nothing to warrant the engagement in fanciful speculations. Yet it is true that though present day linguistics eschew simple and mythological answers about linguistic origins, some still maintain a number of mystical views gleaned from mentalistic psychology. An outstand-

ing example is the theory of innate powers of the human mind properly to organize words in the sentential chains of utterances. Such fallacious ideas of linguistic origins are unwittingly based on notions of speech as vocal expressions of internal states resident in organisms. But behaviorists do not depart from fallacious views when they treat utterances as emissions controlled by "stimuli" as in the Pavlovian reflexological model.

Much of the mythology and the imposed mystery concerning linguistic origins are dispelled when language is treated as actual communicative and symbolistic events. When interested in the evolution of actual linguistic behavior we must separate historical traditions from observed or inferred events. Scientific method stringently requires the study of language behavior as it occurs in the moment by moment activities of organisms.

Concerning speech in general or the linguistic protosystems, it is, of course, impossible to retrace the steps by which they developed from stage to stage during the ages when individuals and populations interacted to originate the linguistic processes that we observe today. But it is the greatest folly not to accept as evidence of language development the data we can now observe of the process. Why imagine a break in the continuity of events when they are obviously in the same family and species?

What is being urged here is to attend closely to the interactional processes as between organisms and actual persons, things, and events. When we do so we observe that speaking behavior, symbological actions, and all other language performances are adjustments and not autistic emissions. What is the basis for communication, and what are the specific gestures, motions, references about, but things and conditions in the surroundings of speaking individuals?

Given the evolution of organisms with the anatomical and physiological capabilities to perform many sorts of vocal and gestural behavior, they can and will develop every kind and variety of action as adaptations to the referent objects and events in their environments. The general linguistic literature is replete with evidence of the influence of one language system upon another, the changes brought about by borrowing and the general diffusion of languages along with other cultural traits.

Unfortunately, all this is usually encased within the theoretical framework of language which regards speech as utterances of words, and more seriously, the transformation of speech behavior into things. In view of evolutionary processes it is hardly necessary to invent improbable speculations about the origin of speech. When speech is properly regarded as the behavior of organisms, it is apparent that because no human organism has ever lived a solitary life, some form of intercommunication is as natural as any other behavior. All organisms have parents and most have siblings, so there is invariably a need for some sort of referential behavior, no matter how simple. It may be that this interbehavior is primarily gestural, consisting of acts of pointing or some similar employment of signs. We must conclude, therefore, that there is no special psychological problem of linguistic origins. Language systems which are today scattered over the face of the globe must be thought of as derived from the detailed development of specific individual patterns of sound and gesture. No doubt the best kind of evidence for the development of language systems is to be found in the differentiation of various systems from some original matrix. For example, Latin has evolved into French, Spanish, Portuguese, Romanian, and so on, while Proto Germanic gave rise to English, German, Frisian, Norwegian, Danish, Swedish, Flemish, and so on. Similar developments are to be traced in the case of other language systems. All such developments have their origins in the necessary first appearance of language behavior in the families of the earliest human organisms.

THEORIES OF LANGUAGE ORIGINS

Despite the succession of mystical theories about linguistic origins, the processes of language development have lost none of their challenge. What seems to be called for is to respect the distinction between linguistic systems as institutions and the referential and symbolizing performance of individuals—to distinguish between la langue and la parole. Basically, why the search for explanations of linguistic evolution has proved so futile is the interpretation of language as entirely word-things. To postulate that language is essentially adjustmental behavior offers greater possibilities for ra-

tional views concerning linguistic evolution, both as abstract systems and as concrete performances.

Credibility is accorded this view when we compare the evolutional approach to problems of origins with traditional theories. An examination of the historical theories that have been proffered demonstrates how misleading has been the word-hypothesis with its expressionistic background and ignorance of the actual functions of speech and symbolization. Prominent examples are the theories which Müller (1823–1900) characterized as the bow-wow and pooh-pooh or interjectional explanations.[1] The bow-wow theory accounts for the use of certain words as imitations of sounds heard, as the barking of dogs, the bleating of lambs, and similar imitation of animals or things. All external sounds are effective stimuli for imitation and the building up of vocabulary on an onomatopoeic basis. The pooh-pooh theory has been proposed to account for words by supposing that environmental happenings produced interjectional sounds in organisms. Surrounding things were thought of as merely occasions for autistic experiences and decidedly not factors in complex interbehavioral fields.

The name ding-dong theory has been applied to the view of Müller that words are derived from internally emitted sounds analogous to the ringing of bells. External things do not call out only interjections but meaningful roots which culminate into words. Speech, he thought, was a specific faculty of man, and it is only necessary to put him into action. But the speech action is only the outward sign and realization of an inward power or faculty of thought or abstraction called reason.

Müller's intellectualistic theory stands in contrast to Noiré's (1829–1889) yo-he-ho theory that language originates in reciprocal situations when sounds are uttered to harmonize the action of two persons while lifting or carrying a load. As in the other proposals, there is no retreat from the characterization of speech as word-things sole or in trains.

A fifth theory suggested by Paget, a physicist, was designed to demonstrate how sounds and the actions of the tongue and other mouth parts become the prime constituents of communicative

[1] Müller, F. M., *Lectures on the Science of Language*, London: Longmans, 1861, Lecture IX.

behavior. This worker in the role of a student of phonetics asserted that all behavior of persons is accompanied by minetic gestures of the tongue, lips, and other mouth parts. Now when the hands are preoccupied with activities then the original pantominetic oral movements become of service, instead of the hand-gesturing which earlier was the means of expressing ideas.[2]

It is interesting to compare the above five linguistic theories with a sixth proposed by a modern psychologist. Essentially, the theory submitted by Thorndike (1874–1949) [3] emphasizes the notion that language or speech answers to the description by linguists of sounds coupled with meanings. Accordingly, he assumes that speech originated with a primitive individual who somehow develops an idea or other type of mental state, and later attaches it to some object by means of an utterance, for example, "ug" with a shell, "ma" with mother, "ba" with ball, "buz" with a clam. Later the associations thus formed by dint of babbling and probability evolved into speech with an indefinite number of associations. Thorndike analogously names his theory the babble-luck theory.

It must be noticed that Thorndike, despite his idea-utterance connections, does rely upon the behavior of persons to account for the associations and the nascent communicative processes. What would improve his theory would be to drop the mentalistic basis and restructure his theory exclusively in terms of adaptations of individuals to the things and the persons with which they interact.

When actual language situations are taken into account, plausible suggestions for the origin and development of linguistic behavior are easy to find. It is only necessary to keep alert to the evolution of biological and anthropological events which tend toward the development of societies. The initiation and multiplication of vocabularies and references to things clearly occurs in order to cope with the thousands of articles that a member of a complex society finds in a hardware or drugstore. Why should it be necessary to assume a break in the continuity of language development as between the period of elaborate civilization and the more primitive ages of animal and human evolution? Both vocabulary and gram-

[2] Paget, R., *Human Speech*, New York: Harcourt Brace, 1930.

[3] Thorndike, E. L., *Man and His Works*, Cambridge: Harvard U. Press, 1943, Chap. V.

matical styles are evolved by many processes, including onomatopoeia, imitating, borrowing, and analogizing. As to intercommunication, the multiplicity of happenings observed and the need to refer to them are performances literally forced upon individuals by the numerous exigencies of living.

ORIGIN OF LANGUAGE AND EVOLUTION OF MANKIND

Since language is a particular type of adjustment, that is, a sample of an organism's interaction with stimulus objects and conditions, it is apparent that the origin of language coincides with the origin of organisms. Now the question arises as to what is included in the class of language behavior. It is clear that despite the mention by writers on language of gesture they more or less inevitably assume that language consists only of highly evolved verbovocal utterances. However, it is certain that linguistic behavior comprises action fields that are very remote from such elaborately evolved intercommunicative performances. One is reminded here of the prominent view that the most advanced systems of organized formal speech are basically derived from the cries of animals. Such a view obviously places such restrictions on linguistic behavior as to assure that the data are bound to be misinterpreted.

What is lost with this overspecialized selection of language data is the essential function of language behavior as adjustments to other organisms and other ambient things and conditions. It is inescapable that the development of mankind is in no sense a matter of isolated organisms but the evolution of a species. Accordingly, the very process of living involves intercommunication among members of single families progressing to small clans and growing to sizable groups with continual increases of cultural circumstances demanding more and enlarged facilities of intercommunication. A study of linguistic origins is well undertaken against the background of the evolution of mankind.

Two circumstances make it impossible to observe the origin of language systems. First, to search for such origins assumes that the term "language" symbolizes some sort of abstract entity. Again, investigation is effectively barred from analyzing speech behavior that occurred long aeons ago. Still, it is possible to formulate reasonable inferences concerning the origin and development of such phenomena. In the first place, there is the continuum of human action such that the general conditions for the beginning and periodic performance of language interactions are common to people of today and of all other ages. Then, too, there are the principles of psychology which can be relied upon for information concerning the circumstances and general auspices of communication and interpersonal behavior.

SPEECH BEHAVIOR AND HUMAN EVOLUTION

Despite the gaps in our knowledge of the precise details of human evolution, no knowledgeable person doubts that human organisms, no matter how highly evolved, have ascended from lesser forms of organisms. For our present purposes there is no need to carry man's pedigree further back than the order of primates which includes also lemurs, monkeys, and apes. It is not difficult to trace a lineage from the prosimians and tarsoids a hundred thousand years ago through Australopithecus, Homo Erectus, Homo Sapiens, including the Neanderthal to Homo Sapiens Sapiens, the accomplished organisms of today.

But even if we go back further to even earlier organisms it is straining a point to deny that individual organisms performed adjustmental interreactions with organisms of their own stage of development. Thus the origin of speech behavior coincides with the evolution of the organism's forming the continuity of the hominidae, while symbolic behavior is to be ascribed to even earlier forms of zoological evolution.

NATURE OF HUMAN NATURE

One prerequisite for the study of linguistic origins is to avoid the influences of venerable constructions of theories about human organisms and to persist in studying them as they present themselves to naturalistic observation. As recent biochemical studies appear to indicate that only slight differences separate human organisms from the chimpanzees, one must conclude that there are other biological factors that account for the great gulf separating the organismic traits and performances of human and ape organ-

isms. Only the human animal could develop such effective and complicated behavior as are included in the formal and grammatical language systems and behavior. Furthermore, account must be taken of the fact that the intimate details of the differences of the two animal forms depend upon a cultural evolution in addition to that of the biological exigencies which shape the anatomy and physiology of hominids and apes.

Whether we concern ourselves with biological or cultural evolution we are obligated to deal with the similarities and differences in the behavior and capabilities of human and nonhuman animals exclusively on the basis of naturalistic conditions. This rule is not always followed. We have already mentioned the bow-wow and pooh-pooh theories which Max Müller has caricatured by these terms, and also other similar constructions.

Suggestions for the general origin of language like the view that speech was born of the need to cooperate in the various activities of human living are not altogether fanciful although it is questionable how effective the need for cooperation can account for the origin or evolution of speech. There are many more occasions and conditions which appear to be fertile opportunities for language development. We have only to keep before us the fact that we are concerned with behavioral adjustments.

Another suggestion not lacking in some merit is the proposal that language developed as a means of carrying out certain purposes. This suggestion no doubt stems from the idea that language consists of signs or symbols. Such a theory serves to obliterate all the circumstances or conditions that actually are present when language behavior begins and later operates.

PROGRESSIVE STRUCTURATION OF LANGUAGE

Directly in line with the evolution of human groups from family units and primitive villages through more and more sizable clans and tribes to final urbanization and sovereign statehood is the gradual formalization and standardization of the language adjustments which originally are crude and indefinite. Later they attain a more organized and stabilized status and become understandable to more individuals, thus moving toward the common language of

a dialectical group. Still later, standardized criteria become established and a preferred dialect enters upon a career of good or perfect speech.

Of the greatest importance for the formalization and standardization of language systems is the development of writing which, in the beginning, consists mainly of the transcription of the messages usually conveyed by means of signs, pictures, or alphabetic structures in the form of systemized sentences with strict grammatical rules and usages.

WORDS OR SENTENCES

In the context of linguistic evolution arises the query whether language has developed first as words or as sentences. From an objective psychological standpoint the entire problem is fatuous gossamer. The question is an arbitrary artifact and displays little or no awareness of the actual events of communicative behavior. Evidently, the arguments on both sides are based upon myopic glances at fully finished language systems such as Chinese, English, French, German, Russian, etc., and is based upon the questionable premise that language consists on one hand of conventional oral speech, and on the other of thing language. No such problem arises from the study of actual language adjustments.

Chapter XVIII

Evolution of Individual Language Behavior

ALLEGED MYSTERIES OF INDIVIDUAL SPEECH EVOLUTION

A remarkable situation exists in the psychological realm with respect to the development by individuals of speech behavior. Although speech data are matters of everyday occurrence in the sense that human organisms born hygienically and growing up in cultural surroundings inevitably become linguistic personalities, general linguists and psycholinguists make deep mysteries about the process. They go so far as to invent innate powers or faculties in children to become speakers and hearers of speech. For the most part they are influenced by the fact that children early in life quickly master the grammar of their family dialect.[1]

As usual we find such divergences between events and descriptive or explanatory constructions to rest upon the adoption of fallacious axioms concerning the nature and method of psychology. For scientific psychology it would indeed be a great mystery if children did not soon evolve specific speaking and symbolizing behavior. When attention is paid to the particular fields in which language learning occurs we may well ask what else could happen than the development of language adjustments along with the habits of wearing clothes, interacting with parents and siblings, eating certain foods, and so on.

The view that children come into the world with innate powers is really not based on any observations, but upon various fallacious intellectual attitudes. Prominent among them is the espousal of the soul psychology of the theological traditions. Persons are presumed to be gifted with psychic entities that can perform intuitive acts in correspondence with bodily action. A related fallacy is that the soul is fitted with faculties or powers to act in supernatural ways, including the obeying of instinctive rules of social grammars.

[1] Notoriously Chomsky and his disciples.

Another fallacy consists of contorting the facts of individual evolution. This amounts to a complete misunderstanding of the maturational development called learning. Linguists rightly reject the widely accepted notion that learning consists entirely of directed conditioning. But they have little regard for the casual growth of adjustments arising from participating in many sorts of situations that comprise human living. Still another basis for misconstruing individual linguistic development is the belief that speech consists of emitting words and conjunctions of words without regard to the actual surroundings and the needs and necessities of communication.

Those who rely on the innateness of faculties to create sentences without actually learning to do so fail to understand that rules of grammar are only constructed descriptions of the arbitrary styles of community systems of speech, for example, the freedom of word order in the Latin systems.[2] In other language systems such freedom is not available. Think, too, of the differences between language systems such that in some speech styles, articles or copulas are omitted. Assuming that we are observing actual adjustments, children will of course fit into the speech habits of the elders in the family or community. What guides the orders and ranks as well as the characters of the words of utterances are the events that are the conditions or circumstances that adults as well as children refer to. When it is the style of the particular language system to stress what are called nouns before verbs, then that is the way the children will develop their adjustments. "Johnny fell down." What else can the child say other than this kind of sentence or utterance when referring to such an accident? It is strange that linguists raise the question why a child won't usually say "Down fell Johnny," or "Fell down Johnny." There is no necessity for inventing powers or capacities on the part of children who speak correctly or effectively. Speaking at all signifies that some event worth mentioning is being

[2] The Latin equivalent of Julius loves Julia can be arranged as follows:
Julius amat Juliam;
Julius Juliam amat;
Juliam, Julius amat;
Amat Julius Juliam;
Juliam amat Julius;
Amat Juliam Julius.

referred to. Also the specific form or pattern of events gets referred to according to the language system of the community. No child is born with rules of grammar or ways of ordering words in sentences. Surely simple imitation is not the only process by which children become culturalized in their speech, but in all cases there are specific types of adaptation to older speakers and to the details of the happenings localized in a language field or circumstance.

The contrast between the interpretation of a child's learning to speak in the form of uttering conventional sounds, and the interpretation that speech development is adaptation to concrete circumstances and intercommunicative persons, is well illustrated by the puzzle of how meanings are expressed through a code of arbitrary linguistic signs. This puzzle clearly involves the fallacious assumption that speaking consists of utterances as signs for things, plus meanings or ideas or other mental states. To consider speaking as adapting oneself to the two primary stimuli, the adjustment and the auxiliary (p. 62f.), excludes any such puzzle. It seems anomalous that obvious observable activities of children or adults in speaking are neglected in favor of the linguistic tradition that speech is constructed out of word elements. There is also the influence here of dualistic psychology.

BEHAVIOR DESCRIPTIONS VS. CONCEPT IMPOSITIONS IN INDIVIDUAL LANGUAGE DEVELOPMENT

A study of linguistic literature strongly suggests the necessity of avoiding the various misconceptions concerning the nature of psychology and language, and also of improving the descriptions and interpretations of very important types of behavior. In this section I explore and contrast two types of what are intended to be scientific descriptions of behavior development. These two types of approach to behavior development consist of (1) imposing categories and descriptions upon events, and (2) describing the events on the basis of observing, analyzing, and experimentally manipulating them.

(1) THE IMPOSITIONAL METHOD

The impositional method of treatment is seen in the assumption that the child first learns to utter sounds (consonants and vowels), then words, and finally sentences, while actually the child performs linguistic adjustments in the same way as all other behavioral adjustments.

While adopting the impositional method the child's tentative and fumbling verbal utterances are taken to be of the order first words and then sentences. This amounts to an oversight of the fact that all the child's behavior develops in a haphazardly progressive way. His walking, grasping, eating, all show similarities of corrigibility and improvement, as does his speaking development.

A most telling instance of imposition is that somehow the language development of a child is based upon a set of recurring rules that permit the understanding of speech and the generating of an infinite (sic) [3] set of sentences, most of which consist of novel combinations. Furthermore, children are said to develop an idiosyncratic grammar which in the course of time is metamorphosed into adult grammar. Obviously, these rules and the grammar are imposed upon the language situation. These rules and grammars are obviously constructs in no sense derived from the observation of speech development. Aside from being purely fictitious categories, such imposed constructs are themselves built upon a foundation of transcendental faculties and supernatural souls.

Certainly the "infinite" sentences sufficiently characterizes this impositional way of treating the language development of children. No child, or adult for that matter, ever utters more than a small number of combinations of words, even when the behavior consists of uttering words. What makes for the utterance of different combinations of words are the referents in the language situation. Given a referential situation involving John, Mary, and love, the utterance is informing as to whether John loves Mary, or Mary loves John, or some variations, as Mary or John is loved by John or Mary. This different interpretation is decidedly naturalistic.

Another serious misinterpretation of linguistic development by children arising from the impositional attitude is to confine language development to rigid chronological stages. The fallacy here stems from the assumption of a "mind" with unfolding faculties, so that speaking and reading capacities are rigidly controlled by age limits. While children are limited by physiological maturation, re-

[3] Such hyperbolic extrapolations of small finite numbers is symptomatic of careless thinking and writing.

lief therefrom ceases at a very early age. Too many exceptions are known of precocious development based upon partially developmental conditions to invalidate the rigid stage notion. A typical exception to the "stage" notion is illustrated in the anecdote about the four-year-old Macaulay who, when asked how he felt after some hot coffee was spilled over his legs, replied, "Thank you, Madam, the agony is abated." [4]

(2) THE OBSERVATIONAL APPROACH

The observational-descriptive approach, of course, implies a meticulous differentiating and analyzing of linguistic adjustments. Frankly, it implies an interbehavioral approach, but close attention to the behavior development of children validates the method. An important bit of evidence is that the speech behavior of children is never performed under the auspices of adult speech situations. It is evident that children are only amateurishly practicing what the adult speech model indicates. Elizabeth is pronounced Lillibet.

WORD UTTERANCES VS. LINGUISTIC ADJUSTMENTS IN PSYCHOLOGICAL LINGUISTICS

The framework of all conventional psychological linguistics is the verbal model. The basic assumption is that speech is oral utterance and that the speech of children is the acquisition of a progressive facility of uttering sounds, words, and sentences as foreshadowed by the structuralistic analysis of the word-things of conventional linguistic theory.

What is overlooked is that linguistic behavior consists of adaptations to surrounding things similar to all other adjustmental performances. It is the various situations in which the individual finds himself that occasions speech, and conditions what is said, as well as the style of utterance. It is the situation, too, that influences whether the referential performances are oral or gestural, and in general characterized in some particular manner.

The linguistic development of children is an inevitable feature of growing up in a human environment which is socially determined by the biological circumstance of bisexual reproduction. But

[4] Sutherland, J. (ed.), *The Oxford Book of Literary Anecdotes*, Oxford: Oxford U. Press, 1975, p. 270.

the biological factor pales into insignificance beside the innumerable factors of societal existence. Human infants can no more escape performing linguistic behavior than nutritional activities; in fact in the early stages of development the two are very intimately connected. Since speech is the optimal means of simultaneously interbehaving with things and persons, linguistic behavior develops on the basis of the conditions and the needs of children. How the adjustment begins, and how it is performed, depends upon the auxiliary stimulations and stimulators.

CASUAL AND CONTRIVED LINGUISTIC DEVELOPMENT

It is of the greatest importance to note that the linguistic development of children does not take place as a matter of learning and teaching. Language as adjustment implies that the development is mainly casual and greatly dependent upon the exigencies of the moment. Not to recognize this feature of linguistic development is to be blinded by some dogma of linguistic tradition. The consequence of overlooking this point is to be victimized by some conventional learning theory or by some psychological dogma of mystical maturation. How many mothers or nurses have the capacity, the interest, or the time to carry on the linguistic teaching operations? And think of the illiterate persons whose children develop linguistic adjustments of a quality different and more effective than that of the parents.

INDIVIDUALITY OF LANGUAGE DEVELOPMENT IN CHILDREN

As in every other type of behavior development of children, linguistic development also manifests individual differences. After all, each child is different in many respects from all others, and displays differences in time of development, in situations to which to adjust, thus varying in vocabulary, means of reference, whether oral or manual or some other form, and so on.

To ascribe uniformities of development for children's linguistic evolution is to impose upon them similarities and duplications derived from the textual model which eliminates the specificities of actual behavioral events. It is only by adopting the adjustmental approach that an approximately correct description of the stages

of linguistic development is available. Whatever uniformities and similarities occur are such as the actual situations provide. It is not to be overlooked that children do not just develop language behavior but adjustments in specific circumstances. If oral speech is in question, they speak English, French, or Chinese, plus the variations of dialect, socioeconomic level, and many other conditions down to their idiolects.[5]

THEORIES OF LINGUISTIC DEVELOPMENT IN CHILDREN

It is paradoxical that recent escalation of studies of children's language development should be based on questionable theories and not merely on the increase of the psychological population with its proliferation of investigations. Nevertheless, such is the case. In general, the variation in the interpretation of the events in question rests on differences in view concerning the nature of psychology. Two basic postulates divide off the naturalistic theories of language development from the theory of supernatural determiners of that development. These postulates concern: (1) the question whether language development is the process of adaptation to stimuli or the manifestation of psychic forces; and (2) whether the development is circumscribed by words and word usages, or concerns rather behavioral adjustments.

Naturalistic theories of language development confine themselves to the construction of generalities based upon the observations of the behavior of children when they perform language adjustments. Account is taken of the various factors that are involved, for example, the normality and maturity of the children, the detailed surroundings of the behavior, and stimulational potentialities of the referents whether persons, objects, or events.

On the whole, the supernatural theories postulate a dualism of soul and body and emphasize the faculties and powers of mind to initiate the development and later performance of words. A number of linguists have recently chosen to disinter the rationalisms of past ages in order to explain language in terms of mystical and mythical psychology concerned with innate mentalism. Typical examples are: (1) making observed utterances into manifestations of

[5] See Hockett, C. F., *A Course in Modern Linguistics*, New York: Macmillan, 1958.

a deeply buried level of soul; and (2) explaining the rapidity of a child's development by a power of soul or faculty for speech.

Support for such antiscientific and irrational views concerning language and psychological behavior is sought in the nonacceptability of reflexological behaviorism both as a psychology and a means of interpreting linguistic events. But this is a weak reed to lean on, and is accusatory for not interpreting events as they are observed, thus avoiding the confusions and contradictions incidental to the assimilation of fatuous metaphysics.

LANGUAGE DEVELOPMENT OF ADULTS

Language development in adults consists mainly of two processes: (1) The development of a type of references to serve as adjustmental performances within the general framework of a particular cultural system, whether local community, dialectal group, or nation. Speakers or referors are influenced by ambient circumstances and referees to modify the forms or the dimensions of their behavior either to make their adjustments more adequate or more agreeable. The principle here is to mend your speech or mar your fortune. (2) A second aspect is the increasing development of vocabulary that enlarges the capacity to make references in new situations. Part of the training or apprenticeship of a pharmacist, hardware merchant, or any professional or engineering aspirant, consists of developing new or additional ways of referring to things and events. Thus, the fact of language as a form of adjustment to ambient conditions is emphasized.

Adult language development is prominently featured in the acquisition of an additional language or languages. In this type of situation the adjustmental character of language comes to the fore. It is an obvious attitude of educators that even the learning to read a foreign language is a small accomplishment, to speak it, almost an impossibility. When the ability to speak an additional language becomes a reality it is facilitated by a residence in the locale where the language is spoken. The situation is improved when the learner is alone without persons speaking his native language so that the necessities for referential adjustments are the prominent orders of the day.

Section Five

LINGUISTIC VARIABILITY AND SPEECH DEVIATIONS

Chapter XIX

Multilinguism and Other Speech Deviations

VARIABILITY IN SPEECH FIELDS

One of the best validated generalizations in psychology is the principle of individual differences. That principle derives from the invariable data that no two individuals are behaviorally identical, even "identical" twins. This is obviously the case since behavior and behavioral traits are developed and performed under very specialized circumstances, and hence organisms and their individual traits must be in some measure different from each other.

VARIATIONS IN LINGUISTIC ADJUSTMENTS

So enormous are the factors making for individual deviations in linguistic adjustments that we can only point out some salient examples. A feasible plan is to set up a simple illustrative categorial system, for example, to divide off personality factors from utterance factors.

PERSONALITY FACTORS

Differences in personality factors center around vocabulary-range and style of linguistic performance. Such variations are functions of maturity and experience, socio-economic class, education, vocation, and avocational interests. Persons of varying professions or occupations must be able to interact with others on a common basis, or with behavior pertaining to a limited mutuality of comrades or colleagues. Members of various classes or social groups may be unable to intercommunicate unless they react on the basis of common acquaintance with referent objects and events.

Of the many personalistic behavior differences, we may cite several contrasting types, for example, the taciturn and the volatile speakers. The former speak as though interpersonal language adjustments involve considerable efforts and acts to be avoided. The volatile speakers, on the contrary, appear to be fond of speaking

and ready to talk upon the slightest prompting. Of course, in each case, the linguistic adjustments are interrelated with other types of interactions with stimulus objects. An extremely interesting type of volatile speaker is the verbigerator who substitutes talk for other more appropriate types of action. Such individuals usually display extremely facile and futile performances. They speak freely and loudly upon any conceivable subject, frequently in inverse ratio to their knowledge about referents. In many cases they are led to make promises they surely will not or cannot perform, and go so far toward concealing their ignorance as resorting to the abnormal process of pathological lying.

UTTERANCE FACTORS

When we turn to verbal utterances as a specialized form of intercommunicative behavior, beside gestures, we observe many and wide-ranging differences. Such variations reveal the identity of speakers, even when they are not present, but speak over the telephone.

In general, variations in speech adjustments depend upon the specific cultural community lived in, social, economic, and educational level, sex, and individual idiosyncracies. Students of language refer to such speech characteristics as (a) speech quality and (b) speech dynamics.

(a) Speech Quality

Under the rubric of speech quality linguists list such descriptions as thin, smooth, flat, rough, hollow, melodious, husky, and so on.

(b) Speech Dynamics

Classified as speech dynamics are such traits as loudness, intonation, tempo, continuity, rhythm, and pitch fluctuation.[1]

Naturally, each of the variations mentioned so far contributes to the general description of the involved behavior, but on the whole, they are regarded as all normal. No complaints or difficulties are lodged against the differences in the speech adjustments. There

[1] See Sapir, E., *Language*, New York: Harcourt Brace, 1921; and Abercrombie, D., *Elements of General Phonetics*, Chicago: Aldine, 1967.

are, however, extreme speech variations that mark individuals as either accomplished or deviant, that is, abnormal. When speech differences are large and noticeable, they serve to categorize persons as advantaged or disadvantaged, unusual, or even pathological. In this chapter we consider the extreme differences which place individuals either at a favorable or unfavorable pole of the speech continuum. As an example of a favorable point of the range we consider the ability to speak more than one language. This is called multilinguism or bilinguism, and the unfavorable point of insufficiency, or loss of speech behavior, is commonly referred to as aphasia.

MULTILINGUISM

Considering the great volume of speech behavior, the rule is that individuals rigidly fit into one type of system. Their speech performances, despite all individual differences, are recognizable as of a special type with particular characteristics of vocabulary, pronunciation, and other traits. The basis for this is the isolation and perennial existence of speakers in a particular geographical locality and community, with a lack of social mobility. But this monolingual condition is frequently paralleled by other circumstances so that it is normal for persons living in situations where several languages are spoken to develop the capacity to interact with objects and persons in the various systems of language. An excellent example here is the multilingual behavior of a child living in Istanbul whose parents are of German-speaking background, and whose playmates are of course Turkish-speaking, while the nurse is French-speaking. The point to notice here is that the child alters his referor and referee responses to accord with the speech of the person with whom he is interacting. This alternating performance is simply a variation of speech in single language situations, except that the entire vocabulary must be changed when the auxiliary stimulus object varies.

Just as the items in monolinguistic situations must vary in accord with the referent, so in multilingual situations speakers must adapt themselves to the many places where different and competing language systems are available. To mention only a few, there

are polyglotic conditions in Belgium, where Waloon speakers live closely to those who speak Flemish; South Africa, which harbors English and Afrikaans; Spain, where Basque meets Catalan and Castillian; and Canada, with French and English competititon. In India, Africa, and many other localities there are many occasions for the shifting and clashing of languages. Every metropolitan city supplies numerous opportunities for the profusion of "tongues."

Multilinguism presents few intrinsic psychological problems, since the speaking of several languages simply parallels the versatile behavior in which individuals adjust themselves to alternative behavior situations. This is more easily seen to be the case when the person adapts himself to the usually simplest form of multilinguism, namely, bilinguism. However, since all behavior adjustments are complicated, problems may arise because of conjoined psychological and nonpsychological factors as indicated below.

INDIVIDUAL DIFFERENCES AMONG MULTILINGUALS

A frequent report made by multilingual speakers is that although they speak two or more languages, they are more competent or facile in speaking one of them. The writer Julian Green is on record as saying "I am more and more inclined to believe that it is almost an impossibility to be absolutely bilingual." [2] Also, Lowie (1883–1957) [3] is quoted as saying "I am impressed with the difficulty of mastering a single language, let alone two languages, in its fullest sense." One of the two multilinguals quoted is a writer unable to translate his own French writings into English, and the other, an anthropologist, raises problems of personality. Lowie declares that when changing from German speech to English there is an alteration of personality.

The facts of bi- or multilinguism afford interesting examples of how inappropriate postulates adversely affect the description and interpretation of linguistic events. Because the word-utterance model is made the basis for observation and description, a number of pseudoproblems are proposed, among them the question whether multilinguism is harmful to the development of intelli-

[2] Quoted from Haugen, E., The Bilingual Individual, in Saporta, S. (ed.), *Psycholinguistics*, New York: Holt, 1961, p. 396.
[3] Saporta, S., Ibid.

gence and other traits. When language behavior is looked upon as adjustmental performances, such pseudoproblems are irrelevant and misleading.

Language as adjustments are excellently observed in the general behavior of children when they do not have arbitrary characteristics imposed upon them, as, for example, the possession of innate patterns of grammar, or fitted with innate categories to force upon their verbal responses to things. Unbiased observation of children at play indicates the ease and naturalness of young children of different families and linguistic backgrounds in communicating with each other about the objects involved in the games they are playing. The interbehavioral approach obviates the discussion of conflicts of phonemes, morphemes, and other abstractions of verbal linguistics. Moreoever, the adjustmental approach brings to the front the difference between ordinary conditions of developing language adjustments and the learning or acquisition of a second language. In the latter case we meet with such problems as the translation of the words of the second language into that of the first and similar problems. Properly and effectively to develop several languages is to duplicate the conditions of behavior development in general. That means to live where the different languages are spoken and under conditions that make interpersonal and intercommunicative relations possible.

INDIVIDUAL DIFFERENCES IN MULTILINGUAL DEVELOPMENT

Multilinguals develop their several language competencies in different ways. Keeping before us the prominence of the individual difference principle, we shall expect innumerable variations in the way of acquiring and performing competing or parallel languages. In one case, as in the example of the Istanbul child, the language learning consists of casually developing speech habits in a multilingual situation. With one person he simply speaks language A, and with another, language B, and with still another, language C, and so on. It is not a rare occasion to see reports in the daily press about persons who have acquired a goodly number of language capacities in the casual manner. An example, aside from waiters and interpreters, is that of a young Peruvian who was allowed to join the American Marine Corps, though he had some difficulty in meeting

the physical requirements because of his slight stature, but was accepted in view of unusual qualifications. He speaks six languages, Spanish, English, French, Portuguese, Latin, and Italian.

This versatile form of language development contrasts with that of the person who acquires or studies what is a distinctively different language. Often the adjustments in this case are marked by hesitations and concern whether one is properly the master of a different language. Of course, when the opportunity offers such a speaker to use the new language frequently and for a long time, the difference in aptitude of speech disappears, and the person becomes what may be called a natural multilingual.

A striking example here is available in the 1945 obituary of Dr. J. D. Prince of Columbia University, who at different times was professor of Semitic languages, of Slavonic languages, and of Eastern European languages. The writer asserted that in later life he could make a witty after-dinner speech in Russian, Serbian, Danish, Swedish, French, Italian, Hungarian, gypsy, or Turkish. He also had a working facility in Czech, Polish, Bulgarian, Slovene, Slovak, Spanish, and Portuguese. He once broadcast to Iceland in the Icelandic tongue. He also had a scholarly knowledge of many obscure dialects.[4]

An interesting linguistic situation is that in which a bilingual speaker lacks the occasion to speak one of his two languages; then he may have some slight difficulty in entering into a dialogue with a person speaking that language. On the other hand, it occurs that when a bilingual speaker goes to a foreign country, and there becomes well adapted to what is the new language, he may have some difficulty to swing back into the originally preferred speech.

MULTILINGUISM AND INTELLIGENCE

Students of language who are concerned with school problems of children have raised the question whether a bilingual speaker is handicapped by his bilinguism. It is said that many children show by various tests, which, of course, are presented in a language new to the children, that they show degrees of retardation, that is, the multilinguism interferes with the development of their "intelligence." It is quite evident that such interpretations are based upon

[4] *New York Times*, October 12, 1948.

faulty notions of intelligence, as well as by the nature and operation of linguistic behavior and the conditions of the testing situations.

The view is also prominent that multilinguism is a decidedly favorable factor in general intelligence, in that the individual develops considerable insights into his linguistic circumstances, and obviously when reading behavior is also in question, the individual becomes better oriented culturally than others who must limit themselves to the literature of one language.

UNFAVORABLE ASPECTS OF LINGUISTIC VARIATION

All behavioral adjustments are subject to improvement, enlargement, disturbances, and dissolution. We now consider modifications and behavior adjustments that are not helpful to the individuals who perform them, and very often they interfere with the person's well-being and ability to adapt himself well, or even at all, to the groups in which he finds himself. These language disturbances are of many types, some of which may be regarded as of minor importance and in general are only mild disturbances. Others are very serious and must be regarded as extreme and pathological. We summarize briefly some of the characteristics of these disturbances, paying more attention to the serious difficulties of speech.

A. THE MILDER DISTURBANCES

Stuttering and Stammering

Of the many varieties of stuttering and stammering, some are hardly noticeable, and can be masked by various means, while others appear as serious interferences in the performance of linguistic adjustments. Stuttering and stammering as general linguistic traits of individuals are familiar to everyone. They may be regarded as extreme modifications of the hesitations and pauses that are characteristic of even superior speakers.

Unconventional Speech

A mild, though sometimes serious, deficiency of speech has become noticeable in the United States in connection with the problems of social equality. Especially persons involved in educa-

tion and problems of conforming to the laws of equal opportunity have had to face the fact that black children display unusual characteristics in their speech, as compared with white children. No question exists but that there are marked differences in the way black children of the Southern states pronounce words and display differences in speech adjustments. Such differences are found in their vocabularies and all the other traits, including grammatical order and ranks. To a great extent, this type of language difference is probably more a matter of social order and class rather than a problem in the psychology of language. However, there are very disturbing features which lead to social upheavals and violent interactions of black and white groups.[5]

B. SEVERE LINGUISTIC DEPRIVATIONS

The following categories cover some of the very extreme linguistic disorders which interfere greatly with an effective adaptation of individuals to their social milieux. Some writers treat these disorders as specializations of aphasia, while others accord them independent status. Following is an illustrative series of such disorders.

Apraxia

This name is given to general disabilities of various sorts. As the name indicates, it is presumed that overt performances are deficient or lacking. When the deficiencies pertain to verbovocal speech the name anarthria is used.

Dyslexia

Distinct linguistic disturbances of the symbolistic type are described as the inability to read. The deficiencies take on various forms. The person may be unable to recognize words, or when he can perceive them, he may lack what is popularly called the ability to decode their meaning.

Agraphia

A unique form of linguistic deficiency is the inability to transcribe messages or to carry out the writing processes necessary for such adjustments.

[5] See Chap. XXIII.

Aphasia

One of the distinctly pathological variations of speech behavior and one that has had a most interesting career, with regard to viewpoints and interpretations, are the disturbances of linguistic reactions called the aphasias. It is important to note that the study of aphasia has thrown considerable light on the nature of linguistic behavior as psychological performances.

Actually the term aphasia represents a chaos of conditions centering around such varied behavior as remembering, vocal articulation, and inhibition. In this chapter we consider briefly the origin and course of this type of language disturbance, as well as some theories about this linguistic trouble.

Individuals who are unfortunate enough to suffer from aphasia through accident or casualty of war certainly appear to be in very serious condition, and yet some aphasic situations are hardly more than highly exaggerated forms of speech impediment as observed in normal speech. Entirely normal persons may discover at times impediments of speech, slow enunciation, and other more or less slight modifications of their speed and clarity of pronunciation. A middle point between the mild and extreme cases of aphasia is the speech impediment called stuttering. Probably because there are all sorts of speech difficulties, observers have constructed many different types of view as to the nature of speech and its pathologies. In the following paragraphs we consider some of the outstanding views that have been proposed about aphasia.

Interpretations of Aphasic Behavior As we can easily surmise, the views as to the nature of aphasia are highly influenced by the attitudes of writers concerning the subject of psychology in general. The name aphasia was originally intended to signify a complete loss of speech. The individual categorized as an aphasic was presumed to be bereft of all aptitude for communication. Clinical reports indicate that such individuals and such conditions are met with primarily in the early stages of gross injury. Later workers in this field have divided off aphasics into classes on the basis of type of loss, because persons diagnosed as aphasics might not be able to name objects or to carry on a conversation, but when questions come up as to particular situations they can speak. Doctors have reported that individuals who were badly injured and could not

speak at all, when put into a strange situation, could utter swear words. What seems to be a misleading point is that the phenomenon of aphasia is tied up with an unsatisfactory psychological theory that if a certain brain center is injured, the person will not be able to speak. But the situation just mentioned would seem to indicate that such a theory has little validity.

One prominent differentiation between types of aphasia was formulated by Henry Head (1861–1940), an English physician. He assumed that there were four clinical forms of aphasia. We reproduce his classification:

1. Verbal aphasia, resulting from lesions of the pre- and post-central convolutions: characterized by loss of articulated speech, with comprehension impaired but recovering rapidly.
2. Syntactical aphasia, resulting from a lesion of the upper temporal convolution: characterized by jargon, slurred speech, impairment of rhythm and phrasal memory.
3. Nominal aphasia, resulting from lesions in the region of the angular gyrus: characterized by loss of power to name and want of comprehension of the meaning of words.
4. Semantic aphasia, localized in the supramarginal gyrus: characterized by disturbance of comprehension of significance of words and phrases as a whole.[6]

Although this writer disclaimed his belief in strict localization, he did attempt to localize the four types of aphasia in different centers which, if injured, would produce the behavior pathology indicated in the listing. A similar attempt to deny strict localization was made by Dr. Kurt Goldstein (1878–1965),[7] who had a large experience with German war casualties, incident to the first World War. He reduced the classification of aphasics to two types. One type of aphasics suffered the loss of the generalizing faculty, while the other lost the concrete attitude, for example, the ability to name objects correctly, or at all. In the description of both types of pathology is lacking the view that speech behavior is not localized at all. The results of brain injury may well be explained by the fact that, because of the anatomical and physiological organization of

[6] Head, H., *Aphasia and Kindred Disorders of Speech*, 2 vols., New York: Macmillan, 1926.

[7] Goldstein, K., *Language and Language Disorder*, New York: Grune and Stratton, 1948.

the organism the injury and loss of parts of the brain serve as conditions of aphasia, since the anatomical and physiological factors participate in the total behavior of which language is an example.

Another example of a denial of strict localization of brain functions with a contradictory belief in some sort of localization is that of Luria (1902–)[8] who is a most diligent student of brain pathology. This author amply demonstrates the influence of mentalistic psychology.

Still another dualistic classification of aphasics was popularized by Weisenberg (1876–1934) and McBride (1904–1976)[9] who divided speech into the expressive type and the receptive type. Clearly what this classification referred to was the fact that some persons could not utter speech references, while others were troubled by the loss of the ability to understand language when spoken to. This sort of classification, like the others we have mentioned, was based on a neurological theory of brain injury as the cause of the action. Here we are reminded of the great differentiation between speech functions based on destruction of what has been called the Wernicke and the Broca areas of the brain. Historically Wernicke (1848–1905) reported the loss of receptive speech when the particular area named after him was seriously injured. The Broca area was localized in the front part of the brain which was presumed to be in control of speech action. Actually, both theories are based upon some facts such as we have indicated as participative, but both were mistaken in assuming that brain operation constituted the causes of the action. We may repeat that because some parts of the organism are destroyed, the individual cannot perform certain actions of which those parts are participative factors.

AUTHENTIC APHASIC THEORY

By contrast with the older theories, we may well assume that the existence of all sorts of mild aphasias or partial aphasias would indicate that what accounts for the lack of fluent speech or, in some cases the lack of speech altogether, are more or less casual factors. For example, there may be too intense eagerness to speak about

[8] Luria, A. R., *Human Brain and Psychological Processes*, New York: Harper and Row, 1966.

[9] Weisenberg, T. A., and McBride, K. E., *Aphasia*, London: Oxford U. Press, 1935.

a certain thing or event, or it may be some intense concentration on other matters. In the case of a serious loss of speech over a considerable time, even when some improvement is noticed, it is quite permissible to explain the lack of speech or an impediment on the basis of some destruction of tissue, either in the brain or some other organ. It is an interesting observation that to attempt to specify the loss of some organ as a cause of speech impediment or speech loss is indifferent to some striking facts. For example, the entire discipline of linguistics got its name from the old tradition that speaking is somehow the exercise of the tongue. However, three clinical cases have been described in which oral speech that is understandable and quite distinct as to articulatory nicety was developed following total amputation of the tongue.[10]

A study of the literature concerning abnormalities of speech makes clear that the misinterpretations are based on the following fallacious notions as to speech and language deviations: (a) the assumption that language behavior is a matter of words and its phonemic and morphemic components; (b) the general acceptance of mind-body dualism; and (c) the intrusion of the brain dogma with attending problems of cerebral localizations of language functions, both "psychic" and organic.

We submit that the great mass of lore concerning extreme variability in language behavior could be reduced to order and well described when language is considered as the actual psychological adjustments they are. Instead speech and language are perverted and misinterpreted on the basis of words which may not even occur in communications, and in general on the substitution of verbal abstractions for the concrete behavior that comprises the actual linguistic adjustments.

We have referred to the verbal fallacy many times, but a word or two is in order to explain somewhat the significance of the neural dogma. As is plain, the neural dogma is a manifestation of the metaphysical dualism of mind and body which has dominated the thinking of Western European thought since the times of the Church Fathers. In the present context a language disability is correlated with a lesion in the cortex. Cortical localizations are

[10] Goldstein, K., Speech Without a Tongue, *Journal of Speech Disorders*, 1940, V, 65–69.

assumed to be the causes of a variation or loss of speech behavior on the basis of conventional verbal linguistics and psychological tradition. The history of neurology affords many striking instances of this attempt at correlating "mental" processes with brain lesions. Excellent examples are the Broca motor aphasia and the Wernicke sensory aphasia. The literature of neurology furnishes numerous examples of more particular putative correlations.

What is of great significance is the grand negative tradition of ignoring the fact that a pathological or mutilated organism cannot perform its adjustments in the way the intact and integrated organism can. However, close observation instructs us that often the trauma of injury can be overcome with the return of equanimity in the organism's relations with its interacting objects and conditions.

In connection with the historical tradition of associating a mind with the brain it is interesting to note the power of mentalistic psychology and the brain dogma to dominate the thinking of experts. How great a role the Broca incident has played in the history of aphasia! Yet it has become known that Broca (1824–1880) did not dissect the brain upon which he erected the dogma of the frontal lobe seat of speech. It was not until 40 years later that Pierre Marie (1853–1940) noticed that.[11] Then when that brain was thoroughly examined it was discovered that it had considerable softening of the left cerebral hemisphere with deterioration of the parietal convolution, the insula, and the nucleus of the corpus striatum.[12]

Neurologists and medical men in general can hardly be condemned for attempting to foster the role of the brain and nervous system. Who will glorify the biological aspects of organisms if not they? Besides, it is to their credit that they interpret aphasic behavior in biological terms instead of purely mentalistic ones. Then again, there are facts for them to stand on in the disturbances of speech which brain lesions bring about. On the other hand, they are guilty of several infractions of the rules of science. One is to exaggerate some data beyond their actual effects. They overlook the fact that the anatomical lesions affect speech not because they

[11] Cole, M., The Anatomical Basis of Aphasia as Seen by Pierre Marie, *Cortex*, 1968, 4, 172–183.

[12] Brain, R., The Neurology of Language, *Brain*, 1961, 84, 145–166.

mark the loss or injury of the seat or cause of language behavior, but rather because, since speech is the action of organisms, their anatomical integrity is basic or conducive to proper performances. The biological components are factors in the total event. They participate in speech through events no more and no differently from other components.

As extreme variations of linguistic behavior, aphasic events comprise numerous conditions so that the milder forms may be owing to circumstances much less serious than anatomical lesions. This fact enables us to dispense with the interpretation of aphasia as identical or coincidental with lesions. Those students of aphasia who insist upon connecting disturbances of speech with lesions do not respect the admonition contained in the suggestion of the eminent Hughlings Jackson (1835–1911):

"To locate the damage which destroys speech and to locate speech are two different things.[13]

Furthermore, to adopt the hypothesis of deviant language as definite variations of linguistic adjustments is to make room for all sorts of variations up to partial or total extinction, as well as for the many specific concrete circumstances attending the occurrence of the variations.

[13] Jackson, J. H., *Selected Writings of John Hughlings Jackson* (J. Taylor, ed.), London, Hodder and Stoughton, Vol. II, 1932, p. 130.

Section Six

INDIVIDUAL AND CULTURAL LANGUAGE

Chapter XX

Linguistic Adjustments and Linguistic Styles

PRIORITIES IN LINGUISTIC BEHAVIOR

Linguistic behavior, like all things else, is subject to the universal and invariable constancy of change. Such changes are manifest in individual utterances, gestural modes of communication, the dialects, and finally linguistic systems. Although the symbolizing form of language pretends toward fixity, referential behavior is performed in many different ways. Variations occur in choice of reference, type and quantity of gesture, and dialectal vocabulary. In technical psychological terms linguistic response functions inhere in a variety of reaction systems.

LINGUISTIC VARIABILITY AS SPEECH STYLES

By contrast with the essential core of reference or symbolization, all the variations in linguistic performances may be conveniently categorized as styles. Probably the most outstanding examples of linguistic styles are the variations in the national or community language systems. We may consider the development of French, Spanish, Italian, Romanch, and Romanian, as stylistic variations from Latin by virtue of circumstances localized in different political units or nations. But similar variations, though not so marked, occur within language systems. It is common to characterize such variations on the basis of arbitrary criteria and scales designed for evaluating linguistic differences. But it is not only language systems that illustrate stylistic modifications in speech. On the contrary, dialectal entities also illustrate the same principle.

Community or national institutions, like conventional beliefs or intellectual customs, influence styles of language. This fact is

illustrated by such variations as, for example, the substitution for the simple "He died" of the parallel "He passed on" or "He passed away." The entire effort of organizations like the French Academy or similar groups of judges and censors of speech styles are presumed to preserve the purity of language by establishing barriers against foreign words, slang, and other impurities of language. All such efforts do not penetrate to the basic core of linguistic adjustments. They pertain to the domains of national egotism, esthetic opinions, or political opportunism. That such intrusions into the domain of referential or symbolic behavior are possible constitutes an unwitting tribute to the adjustmental character of speech.

GRAMMAR AS LINGUISTIC STYLE

Grammars are stylistic institutions, and the best examples are the normative type. With respect to referential behavior, normative grammars are presumed to be sets of rules as to how speakers should conduct themselves. As is easily observed, the criteria of grammar systems center around questions of good and bad, better or worse, esthetic or nonesthetic. Depending upon the grammarian's presuppositions, the rules accepted are regarded as absolute and innate, or simply styles set up by individuals or group traditions.

Outstanding speech styles are available in profuse numbers when the grammars of different systems are compared. The phonetics of the different systemic vocabularies may be regarded as basic styles while the various phases of grammar, such as word order, gender, number, and so on consist of a plethora of distinctive styles that do or do not add to the effectiveness of linguistic adjustments.

Bloomfield [1] set up a comparison of what he called normal and learned utterances which aptly illustrate speech styles. I append his comparisons:

[1] Bloomfield, L., *Language*, New York: Holt, 1933, p. 153.

Comparison of Speech Styles

Normal	*Learned*
He came too soon.	He arrived prematurely.
It's too bad.	It is regrettable.
Where're you going?	What is your destination?
now	at present
if he comes	in case (in case that, in the event that, in the contingency that) he comes; should he come . . .
so (that) you don't lose it.	in order that you may not lose it, lest you lose it.

Invariable and inevitable differences in speech mark the variation between linguistic adjustment and style of phonation, pronunciation, and choice of vocabulary. So while to say "it is not" rather than "it ain't," "going to" instead of "gonna" makes no adjustmental difference, as a reply to a question or other utterance, the difference cannot be obliterated. Style in speech is a definite attribute as good form in tennis playing or some other recreational occupation. While style in speech may be arbitrary and idiosyncratic, it may also involve problems of perfection as clarity in enunciation and effectiveness of understanding.

The entire complex of grammar, with its innumerable variations in accent, stress, phonetic differentiations, high and low dialects, are all matters of speech style. Whether they can be differentiated for esthetic or utilitarian effects is entirely a matter different from adjustmental functions.

One of the most effective sources for the variation in style of performance, whether in general or language behavior, is the setting factor of the behavior field. Sometimes the setting of behavior not only influences the style of performance but other features also. That is, the setting may influence the occurrence or nonoccurrence of given language behavior altogether.

PSYCHOLOGICAL ADJUSTMENTS AND LINGUISTIC STANDARDS

INDIVIDUAL PSYCHOLOGY AND SOCIAL PSYCHOLOGY

Although linguistic behavior, like every other variety of behavior, corresponds to and is conditioned by the circumstances or situations to which it is a response or responses, it is in addition controlled by the attending interpersonal circumstances. The psychology of language is to a great extent social or cultural psychology.

What we refer to as the interpersonal conditions or controls concern the manner or form imposed upon the behavior. Numerous conformities mark the utterances or writing actions. The most general of such conformities are, of course, the dialects or more comprehensive language systems but these, though most typical, are matched and frequently overridden by grammatical rules or language styles. In general, linguistic behavior occurs within a framework of many restrictions. Adjustments must be strictly patterned though sometimes alternatives are tolerated.

Social or cultural psychology may in general be described or defined as the discipline which is concerned with shared behavior occasioned by the facts of group participation. The fact that effective adjustments depend upon similarities in style accounts for the variations between English and American English, the Spanish of Spain and Mexico, or the Arabic of Egypt and Irak. Dialect or system patternings concern vocabulary, intonation, vocal quality, gesturing, and so on.

LANGUAGE FORMS AND LANGUAGE ADJUSTMENTS

The great differences between language adjustments and language forms is sharply limned by the numerous complaints of writers who record the untoward influence of grammatical rules upon free reference to referents. Thus, Gorki says, "Especially was I oppressed by the grammar with its monstrously narrow, stiff forms. I was altogether unable to squeeze into them the living, difficult, and capriciously flexible Russian language." [2]

[2] Gorki, M., *Autobiography*, New York: Citadel, 1969.

Similarly, Silone (1900–) at greater length expatiates upon the difference between Italian as it is spoken in Fontamara by contrast with "standard" speech.

> Do not imagine for one moment that the inhabitants of Fontamara talk Italian. For us Italian is a language learnt at school, like Latin, French, or Esperanto. Italian is like a foreign language, a dead language, a language the vocabulary and grammar of which developed without any connection with us or our mode of thinking or expressing ourselves.
>
> Of course, other Southern country folk before me have spoken Italian and written it, just as when we go to town we wear clean shoes and collars and ties. But one glance at us is sufficient to reveal our discomfort.
>
> The Italian tongue cripples and deforms our thoughts, and cannot help giving them a banal and insipid twist, the flavour of a translation. A man cannot express himself well if he has to translate. If it is true that before you can express yourself well in a language you have first to learn to think in it, the effort that it costs us to talk Italian obviously means that we don't know how to think in it. In other words, Italian civilization is a foreign civilization for us.[3]

These quotations mainly concern the opposition between local dialectal speech and the prescribed utterances of standard language, but they reach down to the problem of individual adjustments versus the models of proper linguistic conduct. The latter very often turns out to be oral abstractions, verbal things held together by written or printed strings. Haugen (1906–) quotes an interesting comment by Morf (1854–1921) printed in 1888 which compares the value of learning about the nature and development of language from texts and from the speech of the people:

> If a botanist wishes to study the growth and nature of a tree, does he go out into the woods or does he go to the botanical gardens? Just so the linguist, if he wishes to study the life of language, must not go to the masters of literature, but to the speech of the people. Any one who listens to the artless words that issue from their mouths will gain more enlightenment on the nature and development of language than from the study of any written texts.[4]

[3] Silone, I., *Fontamara*, London; Methuen, 1934, Foreword.

[4] Morf, H., *Zeitschrift fur neufranzösische Sprache*, 1888, 10, 199; quoted by Haugen, E., *The Norwegian Language in America*, Bloomington: Indiana U. Press, 1969, p. 319.

As social or collective behavior, linguistic action simulates all the other behavioral institutions. Rules, injunctions, and laws, prescribe moral, ritualistic, educational, and domestic conduct, but they are honored as much by breach as by conformity.

Section Seven

LANGUAGE AS COMMUNICATIVE BEHAVIOR AND AS INSTRUMENT

Chapter XXI

Linguistic Behavior As Instrumentality

PRIMARY SPEECH VERSUS VERBAL MANIPULATION

An interesting aspect of psychological linguistics consists of the investigation of the secondary behavior in which language is employed to further some action or circumstance. We may regard the instrumental use of psychological language as behavior of the second degree, since it is not plain reference to, or symbolizing of, referents, but a specialized type of adjustmental behavior. When such performances occur in highly complex psychological situations, as for instance in rhetoric, argument, and philosophical disputation, they include a mixture of referential and nonreferential behavior. The emphasis, of course, is the securing of a result rather than upon simple adaptation.

No lack exists in the celebration of language as an important factor in the development of culture by human organisms, and the evolution of complex behavior like thinking and reasoning on the part of individuals and communities. But as correct as such views may be, they do not adequately represent the many intricate operations that persons perform by linguistic means. Speaking and symbolizing are not merely communicative and indicative actions, but function also as instruments or means to gain advantages in human situations and to bring about consequences of value to the performer and sometimes to the addressee also.

To pursue the subject of the use and misuse of speaking and symbolizing is to investigate the entire field or situation in which such behavior occurs. The question is, what sort of adjustment is the speaking or writing? Is it simply to inform someone of something, or to induce some action on the part of the addressee? Striking is the use or misuse of language to deceive, to defraud, to plead, to explain by metaphor, to argue, or just to play.

Since linguistic behavior constitutes adjustments of individuals to the circumstances of daily living, it is inevitable that language

behavior should be interrelated with other forms of adjustment. Accordingly, the central aspect of the use of speech and symbolization consists of linguistic performance beyond mere reference or indication. This fact may be illustrated by considering language performances in the following samples of complex behavioral situations.

MYTHOLOGY AND RELIGION

Probably the most flagrant illustrations of the misuse of speech and symbolism is to be sought in the domains of mythology, superstition, and religion, since these are the human situations in which contact with events is most tenuous. Language in such situations offers the greatest scope for uttering words, sentences, and more complex speech, and fashioning scripts for various purposes, for example, the creation of formulae and prescriptions to falsify things and events for personal amelioration or escape from actual or putative conditions.

The literature relating to the occult teems with examples of word magic. An outstanding item is the Last Word which if known and pronounced could do unknown wonderful things. Then there is verbal magic such that holy or sacred words inscribed on paper are swallowed to cure various illnesses, or the writing is washed off with water and drunk to bring about the same result.

Clearly there is no break in the continuity of verbal superstition as between so called primitive and distinctly cultivated persons or groups. Thus when we turn to elaborate and sophisticated people we find all sorts of beliefs and delusions supported by written or printed subject matter. Who can escape the power and the effects of printed words? Howsoever misleading and false they may be, they are accepted as the evidence for things and conditions that have no manner of existence beyond the words themselves. Every religion produces a series of gospels or sacred books. Holy sayings and pronouncements take on a vitality and exert influence upon thinking and believing of people, even of the producers themselves. What appear as especially powerful are writings that lead to ritualization of various practices, for instance, baptism, marriage, burial, and other performances.

PHILOSOPHICAL WISDOM

Nothing is more intellectually dangerous than to throw together into one heap all the philosophies of the various cults. But one generalization may be fairly made, namely, that philosophers of most persuasions postulate and try to defend the generalizing and universalizing of people, the universe, and all that it comprises. What this portends is the misuse of language to perform futile and often misleading arguments about the actual characters and behavior of people and the things among which they live.

Prominent among the pronouncements of philosophers are classifications and categorizations as based on linguistic entities. We are reminded at once of the early Greek thinkers who attempted to characterize the essential features of the universe in such terms as water (Thales), air (Anaximenes), infinity (Anaximander), and so on. With the growth of knowledge and general sophistication we note the work of Kant (1724–1804) with his elaborate system of twelve categories, and later the improvements and modernizations at the hands of the neo-Kantians and those who presumed to build better on the established foundations.

The whirligig of philosophical thinking turning between the atmosphere of interest in the world of events and the capabilities of the thinker gave rise to a plethora of categories, such as Rationalism, Empiricism, Logical Positivism, Theism, Pragmatism, and many others. A study of these movements with regard to the winds of doctrine indicates the institutional boundaries of belief anchored in the terms of spirit and matter, mind and the external world. These terms and the thinking they influence all reflect the duality of man and the world as supported by words or symbols throughout the intellectual history of post-pagan philosophy. The history of Western European speech and symbols has become and remain indelibly spotted with such words as soul, self, body, spirit, matter, and so on. It is such terms that influence the culture of the so-called developed nations of the world.

POLITICS

The use and misuse of words and language in political life is notorious. It is obvious and invariable that candidates and parties

operate upon the basis of words in the way of promises and propaganda. For the most part the voters and the governed are aware of the phantasies of the candidates and parties, but in times of election and legislation they assume they are genuine and real. What is effective in such situations are conditions crying out for change, family voting traditions, and the hope of some personal gain and advantage. Thus, words and slogans become the licit coin and all past mockeries and falsifications fade away. "Let us all unite together"; "One flag, one nation, one people"; "No higher taxes"; "No inequalities"; "Justice for all." Such slogans prevail despite their vacuity and misleading pretension.

Outstanding illustrations of the misuse of speech and symbols are evident in the performances at rallies and hustings. At such times, language becomes bereft of all ordinary functions and takes on the traits of instruments and mechanisms for the achievement of advantages to the performer. The perversion of the referential and indicative functions appears greatly magnified in the literature of politics when biographies are written in praise of the preferred candidate and against the opponent.

COMMERCE AND ECONOMICS

Coincident with the density of population and urbanization arises the great specialization in form and manner of living. Exchange of goods and services multiply with corresponding competitions and aggressions. Slogans and verbal formulae take the place of information and intercommunication. Every merchant becomes a purveyor of service, not goods. Every watch, washing machine, or automobile is the best, safest, and least expensive when all nonconditions are considered. Every savings institution is the best place to deposit one's money. "Where you save does make a difference." Supermarket articles are marked "20¢ off" but one is never told from what, if anything, they are off. Those who seek novelties will find the word "new" on the container but not in the contained.

Though these examples are selected from the realm of salesmanship and advertising, similar fraud and misuse of language prevail in the market place in general. Those who wish to purchase certain items find that they must be content with what the merchant has in stock but always "it is just as good or better." Contracts

are made on two levels—the apparent values to be received are printed in large type, but all the restrictions, unfair advantages for the party of the first part are presented in fine print. Salesmen invent formulae as, for instance, "that is the style," or "a very popular item." Even books take on the tempting value as the "best sellers."

COMPOSITION AND LITERATURE

The thinghood of language as employed for good or evil is nowhere so well demonstrated as in the domain of literary composition. Whether tales or books are written for gain, for the urge to invent, instruct, or just please readers, the manipulations of words and sentences, their forms, styles, and shapes clearly show their divergences from the proper functions of adjustmental speech. Literature, though born of intercommunication, has so far evolved as to exist on another plane altogether. By dint of imaginative capacity, language becomes the medium of presentation of the nonexisting, nonconfronting improbabilities of every variety. Words, phrases, and sentences are the building blocks of writers who create analogies, novelties of many sorts and varieties. Words and sentences derived from authentic speech situations are employed as raw materials for tangible productions to suit the demands of consumers.

VERBAL FORMULAE

A definite type of use and misuse of language is the utterance of verbal formulae for various purposes and to suit various occasions. Examples are such consolatory expressions as "C'est la guerre," and the verbal concealment of defeat by calling it a victory. Also to be included are the terms of invective and derision that are applied to self or others for various reasons. And finally, we must mention the peculiar twists and turns produced in words and their combinations when attempting to refer to objects difficult to describe, as in the case of works of craftsmanship or art.

THE USE AND MISUSE OF LANGUAGE

As instrumentality, language can be employed to produce good or evil results as well as for results called neutral, in general, social

and intellectual situations. We sample some of these instrumental uses.

LEGAL LANGUAGE

An outstanding type of language instrumentality is that of the language of law. Because important issues are at stake where pleas are made as complaints, accusations, and defenses, it is assumed that strict phraseology is necessary. This results in a use of words that are presumably clear and to the point, setting forth what may or may not be done, and the exact duties and privileges of contracting parties. But since legal language is transcribed and hence things, it is twice removed from the dynamic situations in which it operates. In the first place, it is different from the speech behavior which operates in immediate contact with the things concerned in litigation. Again, as nonbehavior, legal language is subject to varying interpretations so that the exactitude and precision of the wording fails to attain the ends of the instrument maker, and thus the path is clear for the altercations of contending attorneys. Furthermore, the final decisions are left in the hands of judges or courts, who may be influenced by political and economic considerations.

LANGUAGE IN THE MARKET PLACE

In a culture in which the selling of goods and services looms larger than production and distribution of necessary or desirable objects or services, instrumental language often is employed for dubious purposes. For example, the exigencies of warring competitions brings out the most bizarre utterances and scripts. Illustrative here are the cries of the competing Oriental fruit merchants, one of whom declares, "My figs are better than they look." After which the other responds, "My figs are better than they are." In more complicated social systems, a similar situation is offered by the phrase makers who call every make of car the best, despite all the recalls of cars for changes necessary for safety's sake. Furthermore, distinctive terms and vocabularies are invented to promote sales. No straightforward $10,000.00 is the price, but rather $9,999.95. The principle at bottom is "Nothing is good or bad but saying makes it so."

LANGUAGE IN THE FORUM

Oratory and rhetoric, each in its own way, demonstrate the great difference between the use of words and distinctive language adjustments. The utterances of the orator may be the means of persuading the hearers to some action, casting their ballot for someone, or stirring them to mutiny and rage. How well the instrument of words will serve depends upon the skill and craft of him who wields the verbal tools.

Public declamation in many ways shows the opposite use of words. The actors perform not to achieve honorable or dishonorable behaviors, but simply to amuse and delight the hearers. The acts of the declaimers consist of so using words that they produce affective results in the audiences.

LANGUAGE OF ARGUMENT

Many are the devices by which words are used to produce conviction in persons of originally opposite views. In general, we may describe such instrumental manipulation of words as magic. In religious situations, certain words are taboo, as the names of deities. Also new names are given to old referents, as well as familiar names to new things.

To cite examples, we observe how ad-men use the word "scientific" as a magical means of marketing all kinds of products, including cosmetics of great variety, food items, and many other things. Within the domain of science itself there are magical terms like "evolution," "reinforcement," "force," "faculty," "experimental," and so on. These are presumed to carry great weight even when they are not as applicable as one is induced to believe. An exceedingly striking bit of magic is involved in the use of the term "spirit" or "spiritual." The most essentially mystical and superstitious of beliefs, about acts, things, and nothings, are labeled as ideal and spiritual while confrontable things and events are derided and despised as of no value. In political situations, some outstanding magical terms are "democracy," "revolution," "radical," and "conservative." The use of such words displays the great faith in the instrumentality of language.

Section Eight

LINGUISTIC OBSERVATION AND EXPERIMENTATION

Chapter XXII

Linguistic Problems and Solutions

RESEARCH IN PSYCHOLOGICAL LINGUISTICS

Since psychological linguistics is a subdivision of psychology, it is only to be expected that psychologists, even those who are captives of mystical presuppositions, would attempt to design experiments as aids in observation and interpretation of speech and symbolization. It is just as certain that such complex and variable activities would be found difficult to harness with the rigors of experimentation. Accordingly, the solution of problems in the linguistic field must be mainly limited to field observation. When experiments are set up, psychological workers usually concern themselves with words or word substitutes and sentences, that is, with thing language rather than with actual linguistic adjustments.

Upon the word-thing basis a tremendous literature had developed, including specialized journals [1] to cater for reports of studies using words as materials. This entire industry suggests the facility with which the use of terms influences experimentation in psychology. Under the rubric of associationism in various forms it is mistakenly assumed that authentic language is studied. What seems to lend plausibility to conventional linguistic experimentation is that the actual studies turn in the direction of learning, memorization, judging, and reaction time, while words are employed along with nonsense syllables. Of the problems involved in linguistic research we become cognizant by briefly surveying the types of work that have been done and are now being done in this direction. The plan we adopt for doing so is to report on five samples of linguistic investigation.

Before we do so, however, we must specify what appears as an appropriate model of technical investigation. The investigation of linguistic behavior, as in all other research, comprises an essential system. At the base of the system stands the assumptions or postu-

[1] Notably the *Journal of Verbal Learning and Verbal Behavior.*

lates which control or guide the activities of the investigator while confronting his data or events. Such postulation may result in (1) the conclusion that the study is or is not relevant or possible. Then (2) there is the process of selecting questions to be asked or problems as well as the means of eliciting answers. (3) Next there is the determination of the means and facilities for carrying on the investigation. (4) And finally there are the manipulations and observations which lead to (5) descriptions and interpretations summing up the findings. We turn now to the five types of technical language study.

HOW DO HUMAN INFANTS BECOME SPEAKERS?

This interesting and important question has recently become the basis for an immense investigative industry. Entire libraries are filled with books, articles, and individual reports of investigations. However, all of the work is performed on the postulational basis that language consists entirely or mainly of the vocal utterances of elaborate conventional forms modeled after the speech of adults residing in particular social groups. Unfortunately, the observations made within this type of framework result in the distortion of actual adaptations of infants to their unique environment. The bad effects of such improper postulation are demonstrated by the false descriptions and interpretations of the behavior of infants as they develop within their respective milieux.

Interest in the language development of children has a long history. The sophisticated investigations in the form of systematic observations with theoretical guidance have been preceded by what is called the biographical or anecdotal method in which parents or nurses kept records of the earliest and succeeding utterances of words, phrases, and sentences. Gradually more adequate accounts of language development were offered by Darwin (1809–1882),[2] Taine (1828–1893),[3] Preyer (1841–1897),[4] Shinn (1858–1940),[5] the Sterns,[6] and many others.

[2] Darwin, C., A Biographical Sketch of an Infant, *Mind*, 1877, 2, 285–294.
[3] Taine, H., On the Acquisition of Language by Children, *Mind*, 2, 252–259.
[4] Preyer, W., *The Mind of the Child* (Brown Translation), New York: Appleton, 1888–1890, 2 volumes.
[5] Shinn, N. W., *Notes on the Development of a Child*, Berkeley: U. California Press, 1893.
[6] Stern, C., and Stern, W., *Die Kindersprache*, Leipzig: Barth, 1928, Fourth Edition.

What we may regard as the current sophisticated type of investigation is characterized by careful observations of the development of speech in children supported by hypotheses and theories steeped in learned acquaintance with numerous children reared under various cultures. Unfortunately, conventional investigations of the language of children are marred by cleaving to assumptions concerning not only conventional verbovocal styles, but also the injection of theories derived from conventional constructions of descriptive grammar. The development of children is described in terms of parts of speech like nouns, verbs, adjectives, and in general constructions instead of the actual communicative behavior which is the adjustments of developing organisms.

In the following paragraphs are several samples of inept interpretations of the linguistic performances of children.

(A) HOLOPHRASTIC SPEECH

At early ages children are observed to speak in abbreviated style. Instead of uttering long or short sentences (strings of words), they utter one word. For example, instead of saying "I want to go," "I want to go out," or "I don't want to go out," or "Go away," a child will say simply, "Go." Now just what is occurring? Is there any basis for the notion that holophrastic speech is a stage in proceeding from isolated words to syntax, on the assumption that language is exclusively a matter of verbal utterances?

The alternative is suggested that holophrastic speech is at bottom a matter of general maturation. Children in their communicative adjustments pass through their respective periods of awkwardness and incompleteness. But what guides their efforts are the referents, the conditions to which they attempt to adapt themselves. Attention must be directed to the differentiation between adjustments, that is, psychological performances and the styles in which they are executed.

(B) EGOCENTRISM

Students of child development and child language have formulated the proposition that the early speech of children is egocentric, that young children speak as though they were simply emitting utterances without regard to other persons. Early speech, it is assumed, is nonintercommunicative, as though the activity is verbal

babbling.[7] While it must be admitted that some utterances of children are classifiable as vocal gesturing, it is also the case that the speaker often functions as the referee.

(C) GRAMMATIZATION

A specialized type of investigation of language in children concerns the question of when and how do children become aware of the grammatical rules of their speech, and how do they speak according to such rules. It is this type of study which reaches down to the methodology of speech acquisition study.

One of the first requisites about grammatization is to differentiate between speech behavior and the primal existence or invention of grammatical rules to which children adjust themselves. It is clear that grammatical rules are artifactual descriptions of some phases of speech behavior, but not intrinsic factors in speech behavior at all.

An example is the finding of investigators that children very early utter words that can be categorized as nouns and verbs as well as interjections. Here the conventionalities of formal linguistics have overcome the observational record. What are called nouns, verbs, and interjections, are simply categorizations of actions performed when adjustments are made to objects, conditions, and other events. Interjections are names for affective responses made by children upon contact with particular sorts of stimulus objects.

Probably one of the most flagrant misinterpretations of what is observed in the development of speech behavior of children is the invocation of innateness. It is observed that children as early as the second year are able to utter orderly sentences of some length. Under the influence of soul and faculty psychology, linguists and psychologists attribute these findings to a principle of innateness. Here there is a clash between naturalistic and theological psychology. Scientific psychology allows no place for the innate onset of syntax.

All that is required here is to note that because of the environ-

[7] Piaget, J. (*The Language and the Thought of the Child*, New York: Harcourt Brace, 1926) is a prominent advocate of the egocentricity of children's language. McCarthy, D. A. (*The Language Development of the Pre-school Child*, Minneapolis, U. of Minnesota Press, 1930) challenges this view.

ing conditions of children, that is, the presence of all sorts of things and events as referents, plus the conventions of utterance on the part of the parents, children adapt themselves to language situations. Actually, the process, though it may seem rather magical, is in no sense anything of the sort. We only have here a problem of general behavioral maturation and adjustment. What is termed sociolinguistic situations are sufficient to account for the way the child speaks. Enough things and objects are present to provide a basis for references with the proper order and proper regard for the referees, that is, the persons to whom the child speaks.

How far innateness ideas diverge from actual events is well illustrated when they extend to such differentiations as between competence and performance. Linguists and psychologists assume that it is innate competence that regulates and controls speech performances. Children are endowed with internal patterns or models for proper speech which manifest themselves in effective performances. The distinction between competence and performance is purely autistic and simply misinterprets the fact that as part of the development of language performances, children gradually build up repertoires of references which are performed when the behavior fields are replete with referents and listening auxiliary stimulation. Competence is performance which can be latently reserved and which can be predicted from an acquaintance with what the speaker has previously been in contact.

PARALINGUISTIC INVESTIGATION

A sizable and prominent type of investigation undertaken by psychologists under the names of verbal association, verbal learning, and others, has been cultivated for a number of decades. In fact the research involved in the use of words has formed a viable competitor of animal studies. Despite the terminology used, suggesting language studies, verbal association and verbal learning have no authentic affinity with psychological linguistics. Indeed, the history of this particular branch of psychology carries back to the work of Ebbinghaus (1850–1909) who initiated the methodology of nonsense syllables.

What interests psychologists who labor in this paralinguistic

area are problems in learning, memorizing, and forgetting. In these studies, subjects are presented with various lists of items, words, integers, and nonsense syllables. By the employment of such stimulus objects, answers have been sought to questions as the general psychology of association, the rapidity of learning, the so-called retention after long or short intervals, as well as nonretention or forgetting of the material learned. Now while such studies are far remote from investigations of speech, still there is justification for mentioning them in a treatise of psychological linguistics in order to contrast language with verbologies of every sort. Even when the syllables or words are utterance acts they are nothing more than things, and in no sense psychological adjustments.[8]

STUDIES OF "MEANING"

As we have frequently mentioned, a widely accepted view of legitimate language investigation is based on the postulate that language consists of words in syntactic order and arrangement. Hence experimental studies are based on reactions to words which are presumed to be correlated or otherwise connected with one or more "meanings" or concepts.

Assuming that words represent meanings or concepts, Osgood and coworkers [9] have devised a method or technique called the "semantic differential" for the measurement of meaning. This consists of a number of scales as indicated in Fig. 28 for measuring such meanings or concepts as father, myself, Humphrey, my girl friend, Nixon, my mother, abstract art, Red China, flexible price supports, and so on.

FATHER

happy	:	:	X	:	:	:	sad
hard	:	X	:	:	:	:	soft
slow	:	:	:	X	:	:	fast, etc.

Fig. 28

[8] The following volumes, with their bibliographies, cover the theories and data of paralinguistic investigations very well. McGeoch, J. A., and Irion, A. L., *The Psychology of Human Learning*, New York: Longmans, 1952, Second Edition; Cofer, C. N., *Verbal Learning and Verbal Behavior*, New York: McGraw-Hill, 1961; Cofer, C. N., and Musgrave, B. S., *Verbal Behavior and Learning*, New York: McGraw-Hill, 1963.

[9] Osgood, C. E., Suci, J. S., and Tannenbaum, P. H., *The Measurement of Meaning*, Urbana: U. of Illinois Press, 1957.

Following a factor analysis of the data, the authors found three constitutive factors: evaluation (good-bad), potency (hard-soft), and activity (active-passive).

Granting that the precision and other conditions of study require considerable restrictions and abstractions, it is clear that the present attempt to study meanings is far off from the factors of referential interbehavior. If it has any relevance to linguistic studies it relates to symbolization, but even there the technique is effective only with respect to personal attitudes toward certain words and not to technical symbols as employed in the sciences. The authors defend themselves against the charge of subjectivity by asserting that objectivity concerns the role of the observer, not the observed. But this defense overlooks that scientific investigation is directed toward the nature of things and events, and not merely toward the reactions of the observer or experimenter.

COMPARISON OF HUMAN AND NONHUMAN LANGUAGE

Since language behavior, like all psychological activities, originates as biological and cultural evolutions, it is interesting and often important to compare more or less similar performances in organisms belonging to the various stages of development. In this connection it is encouraging to note that many students have occupied themselves with investigations of language behavior in primates particularly, of course, apes. The comparatively recent attempts to induce chimpanzees to attain to intercommunicative performances have thrown into relief much information concerning language. Outstanding is the problem of criteria for such behavior. Not much less important is the light thrown on the classification of linguistic performances whether it is speech or symbol-using, or whether it is referential behavior or some other form of adjustment. In preparation for an analysis of language behavior it is well to review the trend of chimpanzee language studies.

In 1932, W. N. Kellogg (1898–1972) and his wife took into their home a female chimpanzee named Gua, aged 7½ months with the intention of bringing her up as a companion to their child, Donald, who was just a few months older. The ape and the child were presumably raised alike, each wearing clothes, were fed at table, and played with the same toys. In line with her difference in species

evolution Gua matured in some ways more rapidly than Donald but obviously could not finally keep pace with the boy, who also evolved as a culturally capable organism. The difference between the two infants was exaggerated when they were compared on the scale of cultural language performance. Gua, of course, could not match Donald in developing human language performance.[10]

A similar futile attempt to induce a chimpanzee to perform behavior possible only for animal species on a higher level of evolution was made by Dr. Hayes (1911–) and his wife. Like the Kelloggs, they brought up Vicki, a female chimpanzee, with their child, and treated them alike. Again like Gua, Vicki displayed much behavior similar to that of human children, but as to speech she was unable to advance beyond the utterance of a few vocalisms resembling papa, mama, cup.[11]

Both of these studies, unfortunately, are based upon unsound assumptions. In the first place, it is an error to assume that organisms can perform acts which represent much higher levels of development than they have achieved. Then there is the mistake of overlooking that the different biological evolutions perforce result in potentiality for the human much beyond the capacity of infraprimates.

Later attempts to teach language to apes proceeded on a more sophisticated basis. Dropped was the requirement to have a chimpanzee emulate the speech of highly advanced cultures. Instead, Dr. Gardner (1930–) and his wife (1933–) were able to teach Washoe, a female ape, 19 American Indian signs in 16 months of training and to combine them.[12] A similar study was carried on by Fouts (1943–)[13] with two male and two female chimpanzees.

A very elaborate learning procedure was developed for Sarah, a six year old female chimpanzee, by Premack (1925–)[14] In effect, the work moved on also from speech to symbols and was carried out by stimulating the animal to make associations by means

[10] Kellogg, W. N., and Kellogg, L. A., *The Ape and the Child*, New York: McGraw-Hill, 1933.

[11] Hayes, C., *The Ape in Our House*, New York: Harper, 1951.

[12] Gardner, R. A., and Gardner, B. T., Teaching Sign Language to a Chimpanzee, *Science*, 1969, 165, 664–672.

[13] Fouts, R. S., Acquisition and Teaching of Gestural Signs in Four Young Chimpanzees, *Science*, 1973, 180, 978–980.

[14] Premack, D., Language in Chimpanzees, *Science*, 1971, 172, 808–822.

of plastic objects made into various shapes. These objects were backed with metal so they could be attached to a magnetic slate. Sarah was induced to connect the various plastic forms with herself, objects, and later with other plastic forms so they served as signs for the various associates that they symbolized. Premack used linguistic terms to interpret the materials he used. Isolated plastic forms were called words, and when various forms were attached to the board in vertical fashion he called the string a sentence, following some of the descriptions of linguists.

The Premack studies have definitely revealed hitherto unsuspected capacities of chimpanzees to manipulate plastic counters or "words." Beginning with direct associations of counters and objects, she advanced to names of things by use of counters "name of" and "not name of" when objects were presented. A peak achievement was the ability to compose a string of counters like "Mary give apple Sarah." Beyond this, Sarah having learned to handle the "word" "insert" was able to respond properly to such instructions as "Sarah insert apple pail banana dish." To do this required the appreciation that "insert" applied both to apple and banana but each to be put into separate containers, the former into the pail and the latter into the dish.

Premack raises the question of interpretation of his findings by asking "Can apes be taught language?" and "What is language?" and answers that what the chimpanzees do is not comparable to either what humans or parrots do. The question remains, however, whether apes cannot somewhat approach genuine human linguistic behavior up to the potentialities of their ecological evolution when subjected to the great skill and ingenuity of trainers. More specifically, it may be stated that apes do clearly perform symbolic behavior, though they cannot match the complex symbolistic behavior of humans and certainly not the referential performances of humans.

What must be observed here is the obvious difference between the symbolic and the referential aspects of language. Apes cannot and do not enter into the behavioral situations common to humans. As we have intimated above, it is improper to interpret the behavior of Sarah in terms of the linguistic categories pertaining to humans.

As if the study of similarities of behavior in apes and humans has become a fashion, reports multiply concerning such studies. Within the chronological year, Rumbaugh (1929–), Gill, and von Glasersfeld published a report of the reading and sentence completion performed by a 2½ year old female chimpanzee called Lana.[15] By means of a six month computer-controlled language tracing, they conclude that the ape can both read and write, though not calculate. Apparently by the use of the blanket "language" they believe themselves on the way "to better understand the etiology of language development in man." However, under the severe criticism of Mistler-Lachman and Lachman (1934–),[16] who set up definite criteria for judging the nature of human and nonhuman language, they modify their claims, although they still hope to determine the anthropoids' capacity for linguistic production, including conversation.[17]

At this point, an incisive question arises as to how far one may identify clearly different events by the use of a blanket term and the fact of greater or lesser similitude. Sufficient unto the day is the progress made in the knowledge of what primates can do. Unnecessary is the conversion of anthropoids to anthropos.

Human and Infrahuman Communication

Building upon the assumption that all linguistic behavior is composed of sign things, it is further assumed that a continuum exists which includes various sorts of sounds or gestures as well as human speech. While a general continuity between all animals, human and infrahuman, is established, it is essential to analyze the detailed performances in each type of organism.

Basically we must distinguish between elementary signs or signals as stimuli and the immensely complex situations in which human speech is developed and performed. Sign stimuli consist of the functions of objects to do or not to do some action. A classic example

[15] Rumbaugh, D. N., Gill, T. V., and von Glasersfeld, E. C., Reading and Sentence Completion by a Chimpanzee, *Science*, 1973, 182, 731–733.

[16] Mistler-Lachman, J. L., and Lachman, R., Language in Men, Monkeys, and Machines, *Science*, 1974, 185, 871–872.

[17] Rumbaugh, D. N., Gill, T. V., and von Glasersfeld, Language in Men, Monkeys, and Machines, *Science*, 1974, 185, 872–873.

is the red, amber, and green lights of a traffic system. The amber light is a simple warning to prepare for a go or stop signal. What is lacking is any definite referential function. But it may be possible to record the response to a signal stimulus as approaching symbolization behavior though at a far distance.

The importance of such analyses, as we have just referred to, we face when the question arises as to whether the dancing of bees is to be categorized as language. Certainly we are obligated to guard against the influence of terms like "language" to mislead us into overlooking the essential details and differences between behavior and behavior situations. The same point may be made about the term "communication." There is a tendency on the part of biological ethologists to regard an action of one of a group or herd of animals which stimulates the other animals to run or perform some other action as communicative behavior of a linguistic sort. To do so is to overlook the differences between simple interactions of organisms and authentic language.[18]

Various types of animals, clearly sensing their exhaustion and inevitable defeat in the struggle with the victorious animal, give up the fight and submit vulnerable parts of themselves, as, for example, the fleshy part of the neck. Should one interpret this behavior as saying, "You win, proceed with the coup de grâce?" It should be no temptation so to analogize and anthropomorphize events. Yet the speaking animal tends to do so as in the case of geneticists who "think of genes as sections of the molecular chains of DNA which contain genetic messages coded in particular sequences of nucleotide bases." Dobzhansky (1900–1976) quotes Pontecorvo (1913–) to similar effect.

> The analogy of the genetic material with a written message is a useful commonplace. The important change is that we now think of the message as being in handwritten English rather in Chinese. The words are no longer units of structure, of function, and of copying, like the ideographic Chinese characters, but only units of function emerging from characteristic groupings of linearly arranged letters.[19]

[18] Of interest here is the following book: Hinde, R. A., *Non-Verbal Communication*, New York: Cambridge U. Press, 1972.

[19] Dobzhansky, T., *Mankind Evolving*, New York: Bantam Books, 1970, p. 41.

"Messages," "instructions," "codings," "encodings," are obviously creations of language-using persons who use themselves as models. In stricter descriptions metaphors and similes must be rigidly excluded.

RESEARCH ON POSTULATES OF AUTHENTIC HUMAN LANGUAGE

Despite the paucity of living language studies there exists a number of interesting and significant problems inviting investigation. For example, there is much to learn about the coincidental behavior of the referee and the referor, and both with the referent. It has been observed that a different interpersonal speech relationship exists between closely related speakers when a minimum of reference is required for interaction, as compared with more distantly related persons. In a general way the questions to be asked here concerns the ideolectic and dialectic nature of the utterances of the linguistically interacting individuals.

What differences do varying accents of the interlocutors make for conversation? This brings up problems of distortion ranging from plainness or clarity of enunciation to questions of educational and intellectual levels of the interlocutors. Good examples here are the underlying conditions of the speech systems known as Pigeon English, Beach-la-mar, Chinese Pigeon, Chinook Jargon, and many others. In every complex population, such vocabulary differences are conditioned by differences in occupation or avocation, for example, group sport language, baseball language, legal language, and so on. Recalling that psychological language is adjustmental, all these variations are developed for interbehavioral exigencies.

To analyze linguistic behavior segments, we find on the part of the referor the selective process of speech style, vocabulary, particular utterances that depend upon the referee, and other factors, namely, the conditions under which the interactions take place. Similarly, the performances of the referee are the center of special problems beginning with acuity of hearing to limits of understanding owing to educational, social, occupational, and intellectual competence.

A plethora of psychological problems in linguistics arise from

conditions of the referent and beyond to the auspices of the language behavior. As to the former, the presence or absence of the adjustment stimulus exerts a great influence on the behavior of both the referor and the referee. Again, the range of acquaintance with the referent greatly influences the entire linguistic behavior segment. Knowing the stations and their location greatly reduces the need for hearing or understanding the indistinct announcements of the train conductor.

It is impossible to minimize the influence upon speech behavior of the settings or auspices of the interactions. In general, of course, the settings make great differences in all behavior segments and perhaps even greater ones in the case of speech. A striking reminder of this fact is the inhibition placed upon experiments on language development in children by family circumstances and social and legal restrictions.

In the 1940's at Indiana University, a number of linguistic experiments were designed to throw light on various phases of the living language situation. Data were sought concerning (a) the conditions for understanding by the referees; and (b) the effect of distortion of linguistic stimuli, as well as other features of speech behavior.

WORDS VS. SENTENCES

Briones [20] presented to subjects lists of words and lists of sentences in his native Philippine dialect of Iloko. After each word or sentence the English equivalent was read. Both learning time and later retention were measured. Briones found that original learning was more rapid and retention better for sentences than for words. Learning a language as speech adjustment is superior to learning words.

SPEECH RECEPTION

Bucklew (1914–1974) [21] conducted a series of three experiments on referee reaction. In the first, he presented ten sentences

[20] Briones, I. T., An Experimental Comparison of Two Forms of Linguistic Learning, *Psychological Record*, 1937, 1, 205–214.

[21] Bucklew, J., An Exploratory Study in the Psychology of Speech Perception, *Journal of Experimental Psychology*, 1943, 32, 473–494.

that referred to slides shown on a screen. In one condition, concurrent presentation, the slides and sentences were presented together. In another, serial presentation, the slides were shown after the speech. Subjects pressed a true or false key to indicate whether the sentence referred correctly or incorrectly to the slide. Errors were greater for the serial presentation. Normal speech adjustment occurs when the object referred to and the reference are concurrent.

In the second experiment, one group of subjects (concrete group) saw slides of geometric figures accompanied by statements and another (remote group) were shown statements about common objects without slides. Examples of the statements were "A wagon has wheels" and "Every square has three sides." In both groups sound distortions of key words occurred in some sentences. Subjects were instructed to answer true or false about the statements. In the remote group there were more errors and longer reaction time.

The third experiment varied from the second by using slides of common objects rather than geometric figures and using fewer speech distortions. The differences between the two groups were similar to those of the second experiment. Bucklew concluded that the second and third experiments show that speech is more important in remote than in concrete references as shown by the greater incidence of errors for the latter under conditions of distorted speech. The characteristics of speech reception are inseparable from the psychological situation of which they are a part.

A REACTION TIME PLUS OSCILLOGRAPHIC STUDY

In an investigation that explored the bistimulational characteristic of language interaction, Pronko (1908–) [22] placed his subjects in three different situations. In the first one, the subjects were required to name an object or an event as pictured on one of six slides. The objects in a simple practice series were a chair, a hat, an umbrella, and the events, a girl skating, a boy blowing a bugle, and a child crawling toward a toy. In the second situation, the same things and events were each shown together with a nonsense syllable which the subjects were instructed to associate with the objects and events. In the third situation, the subjects were shown the

[22] Pronko, N. H., An Exploratory Investigation of Language by Means of Oscillographic and Reaction Time Techniques, *Journal of Experimental Psychology*, 1945, 35, 433–458.

nonsense syllables of the second situation, and were required to name the associated objects.

At first the reaction times in the second and third situations were slower than those in the first situation. The nonsense syllable was a symbol for the objects on the slides and therefore involved a translation and a longer reaction time than in the case of responding with a name already used as a direct reference. After 20 trials, however, the reaction time in the third situation was about the same as in the first. Thus, with practice, the utterance of nonsense syllables became direct referential acts instead of just symbols. Oscillographic readings of muscle potentials were also consistent with this finding, and further support the conclusion. The results were incompatible with the symbolic theory of language signifying that a speaker's words are substitute stimuli that produce ideas in the listener. On the other hand, the results do accord with a bistimulational theory. In the words of the experimenter, ". . . an indirect or substitute response may become a direct referential act, as affirmed by interbehavioral language theory." Language consists of "being told about something by someone."

PRACTICE WITH COINED WORDS

Herman (1916–) [23] found that when subjects were required to form associations between coined words (called "foreign" words) and objects they did not show direct referential interactions but interacted sequentially first with the speaker, and then with the object. In a follow-up study Herman [24] showed that with sufficient practice the interactions with speakers and objects changed from serial or sequential interactions to a direct referential interaction. Interaction with speaker and object occurred concurrently or as bi-stimulation.

EFFECT OF LISTENER ON SPEAKER

Ratner (1925–1976) and Rice (1938–) [25] demonstrated that speakers who were speaking to poorly informed listeners used

[23] Herman, D. T., Linguistic Behavior: I. Some Differentiations in Hearer Responses to Verbal Stimulation, *Journal of General Psychology*, 1951, 44, 199–213.

[24] Herman, D. T., Linguistic Behavior: II. The Development of Hearer Interaction with Holophrastic Language Stimuli, *Journal of General Psychology*, 1951, 44, 273–291.

[25] Ratner, S. C., and Rice, F. E., The Effect of the Listener on the Speaking Interaction, *Psychological Record*, 1963, 13, 265–268.

more words and more repetitions and provided more thorough accounts of the object referred to than did speakers who spoke to listeners who were well informed or moderately informed. The effectiveness of language as a referential act is therefore not merely a matter of words used, but also of the interbehavioral history of the participants.

EXPERIMENTS WITH APHASICS

Wolf (1914–) [26] used aphasics who had brain lesions as his subjects in a study of setting conditions and stimulus objects. He found that the setting conditions were important. Subjects could more often name objects correctly (use of speech) or point to them correctly (understanding of speech) when they were in their normal context. The stimulus objects were table items such as plate, spoon, fork, salt shaker, etc. When they were in an unusual and irregular arrangement, accuracy of speaking or understanding decreased. This finding was contrasted with the usual one of brain lesion as the sole determiner of deficit. In his second study he used table items of two types. The items were in two rows of six each or in a conventional arrangement. Again, brain damage was not the sole determiner, but played largely a delimiting role. The specific interactions involved the total interbehavioral field of which biological deficit was one participating factor among many. Some objects were named—or understood with a higher frequency of accuracy than others. When errors were made they were not random but were in some way related to the appropriate response. For example when the experimenter pointed to salt the subject might say "pepper, no." Wolf concludes that "No more should the patient's behavior be regarded as fixed by tissue destruction. He varies from time to time, responds with greater facility to some objects than to others, and differently to the same object in different situations."

CONCURRENT ACTION IN SPEECH

Ratner [27] has suggested that in addition to the speaker, listener, and referent in language interaction, there is sometimes a fourth

[26] Wolf, I. S., Stimulus Variables in Aphasia: I. Setting Conditions, *Journal of the Scientific Laboratories, Denison University*, 1958, 44, 203–217.

[27] Ratner, S. C., Toward a Description of Language Behavior: I. The Speaking Action, *Psychological Record*, 1957, 7, 61–64.

variable that he calls concurrent action.[28] This may involve the interaction of the speaker with himself at the same time that he is speaking. That is, he would listen to his own speech sounds. Or he might react to a cigarette or some other object while he is speaking. By using instrumentation to delay the speaker's hearing of his own speech activity, it is possible to study the effects of this type of concurrent action. The disruption such a delay causes as shown in a number of experiments indicates the importance of concurrent action in maintaining normal speaking activity. In one experiment [29] children of ages 6–13 received this "delayed speech feedback." Initially 85% of the subjects spoke more loudly, and 100% made articulatory errors. The speech of younger children showed more modification with the delay than did that of older children and adults. The major change was slower speech and more errors in articulation. The older groups improved with practice, and the younger ones got worse. Thus, amount of previous speech history as a function of age influenced the effect of practice with delayed speech sounds. Such sounds as concurrent action appear to have an important role in the regularity of our language activities because of the interactional history we have with them. When these conditions are changed, a period of readjustment is required during which well-established speaking characteristics may be disrupted.

[28] Apparently a synonym for by-play reactions.

[29] Ratner, S. C., Gawronski, J. J., and Rice, F. E., The Variable of Concurrent Actions in Language of Children: Effect of Delayed Speech Feedback, *Psychological Record*, 1964, 14, 47–56.

Section Nine

PSYCHOLOGICAL LINGUISTICS AS INTERDISCIPLINARY SCIENCE

Chapter XXIII

Psychological Linguistics and General Linguistics

LINGUISTIC RELATIONS AND IRRELATIONS

Up to this point we have stressed the distinctly psychological aspects of language. This procedure is entirely justified by the fact that psychological linguistics as a specialized subdiscipline of language study is primarily concerned with a unique type of adjustmental field. Consequently, the psychological aspects of language differ in many respects from those in the domain of general linguistics, in which language is treated mainly as things, that is, word forms or signs, structured and organized in various ways. However, despite the difference in subject matter and problems, psychological linguistics and general linguistics sustain intimate relations, since language things have historically developed as products of language behavior, either as transcriptions of communicative adjustments, or as crystallizations of symbolic behavior.[1]

How close psychological linguistics and general linguistics are is testified by the numerous declarations general linguists make that language is action, though they refer only to the facts that speakers produce sounds by expending organismic energy. A typical statement is that of the late Danish linguist Jespersen (1860–1943).

> The essence of language is human activity—activity on the part of one individual to make himself understood by another, and activity on the part of that other to understand what was in the mind of the first. These two individuals, the producer and the recipient of language, or as we may more conveniently call them, the speaker and the hearer, and their relations to one another, should never be lost sight of if we want to understand the nature of language and of that part of language which is dealt with in grammar. But in former times this was often overlooked, and words and

[1] Here I take strong objection to the general linguistic notion that "speech is a rendition of writing, not *vice versa*." Cf. Householder, F. W., *Linguistic Speculations*, Cambridge: University Press, 1971. No doubt what is pointed to is that writing is derived, at least in part, from signs, marks, and pictures, and that the establishment of writing and written things influences speech forms. But the facts do not allow the confusion of communication or messages with the style in which they are performed.

forms were often treated as if they were things or natural objects with an existence of their own—a conception which may have been to a great extent fostered through a too exclusive preoccupation with written or printed words, but which is fundamentally false, as will easily be seen with a little reflection.[2]

A similar, more recent, assertion is that of Bolinger (1907–) who writes,

Written records and tape recordings are embodiments of language, but language itself is a way of acting. Our habit of viewing it as a *thing* is probably unavoidable, even for the linguist, but in a sense it is false.[3]

What looms as the great barrier between the two disciplines is the total neglect by general linguistics of the large interbehavioral fields in which persons interact with other persons, and things they speak of. General linguistics has no place for the consideration of the speaker's and hearer's personality traits as regards the central core of communication, namely, the specific traits of the referents involved as well as the general environments of the linguistic fields.

Although we emphasize the variations between general linguistics and psychological linguistics in order to throw into relief the traits of psychological language, this is not to minimize any interrelated data.[4] Hence we may regard the term "general linguistics" as naming a class of subdisciplines which includes psychological and nonpsychological linguistics as coordinate types of study located at different points on a continuum.[5] We proceed now to compare and contrast the two approaches to language with respect to a number of issues, as well as indicate the interrelations between them.

I. COMPARISON OF GENERAL LINGUISTICS AND PSYCHOLOGICAL LINGUISTICS

Intradisciplinary Variations

(a) Divergence in Origin General linguistics definitely developed on the basis of interest in textual material. As early as the

[2] Jespersen, O., *The Philosophy of Grammar*, New York: Holt, 1924, p. 2.
[3] Bolinger, D., *Aspects of Language*, New York: Harcourt Brace, 1975, p. 14.
[4] It is assumed, of course, that data are different from constructions.
[5] The reader will note an apparent correspondence between this classification and the langue, langage, and parole of general linguistics. But the variations must also be noted.

Greek period of our culture, the question was asked whether words naturally or conventionally acquired their meanings. An instructive illustration of this interest is furnished by the *Cratylus* of Plato (427–347 B.C.). From that time on, scholars became assiduous in their study of the letters making up both sacred and profane scriptures. It was this type of word study that led students who worked with the sacred Sanskrit texts to observe the similarities between language and their discovery of the cognate relationship between Sanskrit, Greek, and Latin. Other language family memberships were observed besides the Indo-European or Indogermanic, such as the Semitic, Hamitic, Amerindic, Bantu, Finno-Ugrian, Ural-Altaic, and so on. More familiar perhaps are the sibling relationships of French, Italian, Spanish, Romansch, and Romanian in the Latin family, as also the connection between English, German, Dutch, and the Scandinavian systems in the Germanic family.

From such studies of words in relation sprang the interest in morphology and content of language. The study of forms and structures of words evolved into elaborate analyses of words into sounds or letters and the synthesis of sounds or letters into words, and words into sentences and more comprehensive combinations.

Psychological linguistics, by contrast, stems from the observation of what organisms actually do when they speak or intercommunicate. The interest is primarily in actions under specified types of field composition such as we have described in earlier chapters of this book.

(b) Divergence of Subject Matter and Investigation The two subdisciplines contrast greatly with respect to what is being studied and how. The general linguist strongly inclines toward the study of abstractions, paradigms of various types, descriptions, interpretations, and other types of constructions which he frequently confuses with both the language behavior he is presumed to study, as well as with the referents of linguistic fields. Both types of confusion are owing to the word-study tradition of general linguistics, though the identification of constructions with referents is more glaring. For example, word classes—nouns, verbs, and other "parts of speech", as descriptive constructs are assumed to be the things described, or at least their names. Adjectives and adverbs are regarded as modifiers of nouns and verbs, and not as references to traits of

objects spoken of. That the speech parts categories are arbitrary descriptive terms for objects and their traits is demonstrated by the fact that what are called nouns in some contexts must in others be verbs or vice versa. And this is the case with other "parts of speech." [6]

Jespersen supplies an interesting paragraph on this point:

> Take the form *round:* this is a substantive in "a round of a ladder," "he took his daily round," an adjective in "a round table," a verb in "he failed to round the lamp-post," an adverb in "come round tomorrow," and a preposition in "he walked round the house." *While* similarly may be a substantive (he stayed here for a while), a verb (to while away the time), and a conjunction (while he was away." *Move* may be a substantive or a verb, *after* a preposition, an adverb, or a conjunction, etc.[7]

The word-tradition further influences the general linguist to ignore the fact that communication acts can be perfectly performed by gestures which make the notion of speech parts completely redundant. Certainly speech parts are not the atoms or particles of which language systems are compounded.

The contrast between the word study of general linguistics, and the psychological linguist's investigation of organisms and persons acting in situations in which they perform adjustmental reactions to things, events, and conditions, clearly marks a difference between a scientific approach to observed data as against the humanistic treatment of communicative behavior.

Although it must be freely admitted that scientific treatment of complex communicative events are difficult, still it cannot be denied that the results to be expected are promising. Moreover, it is clear that general linguists assume that their abstractionistic procedures actually represent concrete performances.

Variant Attitudes Toward Linguistic Problems

The comparative characteristics of both general and psychological linguists are well indicated in the different ways they approach various linguistic problems. we consider several recent items.

[6] Cf. Kantor, J. R., *An Objective Psychology of Grammar,* Bloomington: Indiana U., 1936.

[7] Jespersen, O., *The Philosophy of Grammar,* New York: Holt, 1924, p. 61.

Structuralism and Functionalism Since general linguistics is primarily concerned with word-things, it is one of its most cherished traditions to subdivide language data into the laminated system of sounds, morphemes, words, and syntactic word sets generally called sentences. Here we see the clearest evidence that general linguists reduce speech behavior to objects. The process is first to neglect the ever-present behavioral fields in which speaking occurs. Then the textual-studies tradition impels the concentration upon verbovocal things with the disregard of gestures, personal implications, referents, linguistic auspices, and other components of interactional situations. Hence general linguistic studies center around problems of structure.[8]

Perhaps without full realization of imitating the procedures in chemistry, sounds have been regarded as the elements of speech which are compounded into words. In line with the selectivity and abstractionism of scientific conventions, the general linguist, when he is required to take account of the great variations of utterance in similar situations, turns to a construct named "phoneme" and away from the actual sounds uttered by individuals when performing referential behavior.

The structural linguist next compounds sound atoms into the radicals called syllables which then are further compounded into word molecules. Analytic procedures lead to the distinction of formal elements, for example, base or root with prefixes, infixes, and suffixes. Also there are the ways the particles are combined or not. The technical terms *isolating, agglutinating, inflecting,* and *polysynthesizing* indicate the various means of structuring word-types. Syntagmic and syntaxic combinations constitute the most complex combinations of words. They indicate the type and quantity of forms organized into systems that regulate the order and arrangement of verbal molecules.

Functionalism in linguistics only partially departs from the basic views of structuralists. This fact is illustrated by the assertion that since language works as an instrument to carry out certain goals, linguists should be concerned with the functioning of that

[8] It is interesting to observe that structuralism in linguistics to a great extent has been based upon the desire to describe speech as independent of mentalistic complications.

instrument.[9] Clearly the notion of language as an instrument maintains the thing aspect of language though it does also allow for the activity and use of language things. While the psychological linguist must approve of the move toward action, the functional view does not get very close to the actual drama of linguistic behavior, but still clings to thingness.

Because psychological linguistics works entirely on the basis of the drama of intercommunication, it avoids altogether the implication of structural analysis and synthesis of things on various levels of complexity. But if linguists persist in working on the level of words and not behavior, psychological linguists cannot object to the clever descriptions of word-things. Not all general linguists are enrolled under the banner of structuralism, although in 1953 Martinet wrote "Most of the outstanding linguistic theoreticians are convinced and active structuralists." [10] Accordingly, general linguistics harbors a group of functionalists.

Scientific psychology questions the entire divisive distinction between structuralism and functionalism as well as the question whether one has greater merit than the other. From an objective psychological standpoint, it is clear that to analyze speech into levels—phonemes, syllables, words, and sentences, does stress the textual and transcribed aspects of language. It is of the greatest importance to be aware of the advantages and disadvantages of structural abstractions in linguistics. On the whole, the functionalists incline toward the behavioral side of language in their approach. However, they do not avoid what the structuralists wanted to avoid, namely, the transcendental processes as explanatory features of general linguistics.

(b) Attitudes Toward Grammar Among the critical differences between general and psychological linguistics stands the attitude toward grammar. For the most part, general linguistics treats grammar as presumptive descriptions of verbal performances plus systems of rules for the organization of sound units into words and words into phrases and sentences. Of the four branches of conventional grammar, phonology, morphology, syntax, and semantics,

[9] Martinet, A., *A Functional View of Language*, Oxford: Clarendon, 1962.
[10] Martinet, A., Structural Linguistics, in Kroeber, A. L., *Anthropology Today*, Chicago: U. of Chicago Press, 1953.

the syntactical branch glaringly emphasizes the thing aspect of language. But the thinghood of speech pervades all aspects of conventional grammar.

From the psychological standpoint, traditional grammar is simply the description of and prescription for word usage, when the behavior consists of verbal utterances. Psychological linguistics envisages grammar as simply a style of adjustment which allows for all sorts of variations in pronunciation, word preference, and the conveyance of meaning. What the individual does in either his verbal utterances or gestures is to refer to some thing or event, but the way he does it depends on a number of ambient and historical factors. The entire matter is illustrated by the following examples. In German the sun is feminine, that is, references to it are in the style of "die Sonne;" the moon is masculine, "der Mond." In French the opposite fashion is in order. In English, of course, the gender reference is omitted altogether except in poetry. Again, in German, the style of reference to a child or woman is neuter—"das Kind," "das Weib." In all languages nothing is more regular than the irregular.

The difference in attitudes toward grammar is excellently exemplified in the consideration of the problem of Black English. Some teachers insist that the dialect called Black speech should not be encouraged, and indeed, should be obliterated as a part of the education of the children. On the other hand, it is argued that since the children belong to, and will be living in, certain groups, they must be allowed to speak in the style which is current in their communities. From a psychological point of view, it is clear that two events must be sharply differentiated: one is the efficiency of reference, and the other the style in which the reference is performed. Those who oppose the use of Black English stress the fact that after all the style of the nation's language is standard English, despite the dialectal modifications. Therefore, to be a successful member of the prevailing community the style of speech must conform to that of the standard style.[11]

The variations between standard and dialectal grammar bring to the fore the essential facts of communicative speech. Where shall

[11] Cf. Dillard, J. L., *Black English*, New York: Random House, 1972.

we look for the archcritic, the primary censor, or the authoritative prescriber of how referential or symbolic behavior should be performed? Who is the inquisitor who sets the limits of propriety for intercommunications? True, one may accept particular criteria of elegance, but may the guidelines set up clash with the effectiveness of dialectal or colloquial speech? Without impugning grammatical judgments or disdaining institutional conventions, we should be clear concerning the various aspects of speech, namely, the adjustive functions and the particular utterance and gestural patterns.

When we consider the four conventional aspects of grammar systems, namely, phonology, morphology, syntax, and semantics, we find in each the parallelism or opposition between what individuals do and what the grammar books describe and prescribe. These variations run the entire gamut from sounds, word shapes, word orders, and verbal references. All this is plainly evident in the performance of Black English, an example of which follows.

The scenario of two children reading a story in which the line "see what is here" appears becomes the occasion of the following dialogue:

"Wha da wor?"

"Da wor *is*, you dope."

"Is? ain't no wor *is*. You jivin me? Wha da wor mean?"

"Ah dunno. Jus *is*."[12]

A further example is:

"din teacher start checkin' de boys, see which one had i'. An' one boy name Bill Bailey had a whole pocketful of i'. An' teach' say I'ma tell dis to de princiba too dat chu go 'round stealin' school prope'ty. He say I ain' steal school prope'ty. My muvver pay for dis whin she pay for de tax. She say, your muvah ain' pay for dis. Dis b'long to de school, an' she start talkin' all lat ov' ol' junk an' waster half de peri'd. Din we start talkin' 'bout light, how, speed o' light an' na speeh o' soun' an' all 'a' kinna stuff."[13]

Among other examples of the variations between standard speech and actual speech performances consider the speech of Shaw's heroine in *Pygmalion*.

[12] Seymour, D. F., Black children, Black Speech, Commonweal, 1971–2, 95, 175–178.

[13] Thomson, P., Washington's Second Language, *The Washington Post*, POTOMAC, Sunday, June 11, 1967.

Ow, eez ye-oo a san is e? Wal, fewd dan y'de-ooty bawmz a mother should, eed now bettern to spawl a pore gel's flahrzn than ran awy athaht pyin.

Oh, he's your son, is he? Well, if you'd done your duty by him as a mother should, he'd know better than to spoil a poor girl's flowers and then run away without paying.[14]

In an article by Wilson [15] it is reported that when the preacher Spurgeon was once asked how to distinguish a Baptist from an Episcopalian he said:

A Baptist reads from his Bible the text, "Ee that has eears to 'eear, let him 'eear." But an Episcopalian intones it, "He that has yaws to yaw, let him yaw."

In the same article the writer quotes Shaw as follows:

All the members of the B.B.C. committee speak presentably; that is, they are all eligible, as far as their speech is concerned, for the judicial bench, the cathedral pulpit, or the throne. No two of them pronounce the same word in the English language alike.

It may truly be said that general linguistics is concerned with standard speech, while psychological linguistics takes account also of the vernacular, what the Germans call *Umgangsprachen*. Does not the utterance "Ilproblygo" more accurately represent individual speech than the formal "I shall probably go?" The same comparison may be made between "didjaduit" and "did you do it."

(c) Language Adjustments and "Meaning" Among outstanding variations between general linguistics and psychological linguistics, whether appreciated and acknowledged or not, looms the opposition between general linguistic behavior and putative "meanings." Students of general linguistics, whenever they concern themselves with problems of meanings, are directly or indirectly influenced by mentalistic psychology to the unfortunate detriment of their descriptions and interpretations.[16]

For the most part, general linguists openly follow the orthodox line of mind-body psychology, and in consequence separate both

[14] Kantor, J. R., *An Objective Psychology of Grammar*, Chicago: Principia Press, 1952.

[15] *New York Times*, February 25, 1934.

[16] See early chapters of this book.

the sounds of speech as physical, and the utterance responses as physiological, from the psychic meanings or ideas which they "express." As a matter of course they locate the invisible and intangible meanings and ideas in a "mind."

A representative example of this definitely dualistic viewpoint is expressed in the triangular diagram of Ogden (1889–1957) and Richards (1893–) [17] in which the connections between signs and referents must pass through mental processes.

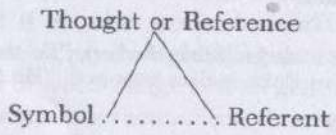


Fig. 29

There are, however, a comparatively few linguists who sympathize with or deliberately espouse a behavioristic type of psychology.[18] For them the connection between signs or symbols and the things which they represent is direct. The behavioristic interpretation, however, involves a serious confusion between referential and symbolic events. Hence, there is lacking a proper appreciation of actual behavior. The entire discipline of general linguistics is transformed into the study of linguistic things and their structures.

From the standpoint of scientific psychology from which all intangible and unobservable factors are removed, meaning in general consists of behavior, which mediates and facilitates some further action. Accordingly, when someone refers to some event or thing the meaning involved is simply the act of referring or mentioning what is spoken of in the presently occurring situation. The meaning act then influences succeeding language or nonlanguage performances on the part of the original speaker or listener. It is hardly necessary to add that it is the factors of the general linguistic field that influence the occurrence of linguistic action and its significance.

[17] Ogden, C. K., and Richards, I. A., *The Meaning of Meaning*, New York: Harcourt Brace, 1923.

[18] Notably, Bloomfield, L., *Language*, New York: Holt, 1933.

The striking differences between general linguistics and psychological linguistics with reference to the subject of meanings may be symbolized by the contrast between the verbal descriptions of the former and the behavioral observations of the latter. This distinction may be illustrated by comparing speech fields by the psychological linguist.

The general linguist wedded to the study of words asks when a word is uttered what is its meaning. For example, in the case of such a word as "bear," it might "mean" an animal, a burden, witness, fruit, and so on.

When actual linguistic behavior occurs, there are no problems of meaning at all. There are no isolated words that require decoding by the interpreter. What is being referred to by the utterances of normal speakers is completely clear by the field in which the behavior occurs.

The advantages of the psychological-linguistic interpretation of meaning over the general linguistic one are pointed up by the contextual view of some writers. The contextual view may be regarded as neutral with respect to psycho-physical dualism, and is surely a great improvement although it is confined to verbal utterances and requires the addition of the basic field factors. The following quotation illustrates the point.

> As we know so little about mind and as our study is essentially social, I shall cease to respect the duality of mind and body, thought and word, and be satisfied with the whole man, thinking and acting as a whole, in association with his fellows. I do not therefore follow Ogden and Richards in regarding meaning as relations in a hidden mental process, but chiefly as situational relations in a context of situation and in that kind of language which disturbs the air and other people's ears, as modes of behaviour in relation to the other elements in the context of situation.[19]

The great objection to the abstractionist viewpoint is that in actual intercommunicative situations single words for the most part would be arbitrary abstractive constructions. To bring in context should lead to the realization that in actual situations there is no such problem as conjoining a meaning to a word. Awareness of situations helps to clarify the facts concerning what is said and how.

[19] Firth, J. R., *Papers in Linguistics 1934–1951*, London: Oxford U. Press, 1957, p. 19.

(d) Linguistic Behavior and Descriptive Abstractions Linguistic propositions as descriptions and interpretations are of course typical constructions that stand over against speech events as linguistic data, that is, referential and symbolizing behavior. Accordingly, this invariable polarization allows and even makes necessary the development of selection and abstractive procedures. Descriptions and interpretations take on the functions of metaphors or similies since the particular words and sentences used are flexible and shifting. Sounds are described as phonemes, words as forms, and sentences as strings of forms or utterances. Grammatical entities are named parts of speech even though speech has no parts, adjectives are said to modify nouns when the speaker refers to aspects of referents.

It must never be forgotten that speech events are the final arbiters of the limits of allowable abstractions. Arbitrary abstractions may be misleading in the extreme. To describe a request adjustment for a hat may not be a precise and orderly expression like "Give me the hat" since the speaker will actually say, "Gimme my lid, cover, topper" and so on. Similarly, instead of "Did you do it?" the data really are the utterance, "Didjaduit?" The psychological linguist insists that scientifically described events can only be derived from the utterances observed, or from the gestures performed.

General linguistics differs quite markedly from psychological linguistics in its inclination toward the institutional phases of language. By linguistic institutions we understand the established entities like literature, texts, whether sacred or profane, traditions of all sorts, language systems, all of which stand over against the individual and personal performances which consitute the concrete adjustments of persons in specific interbehavioral fields. Of course, there are intimate reciprocal influences between institutional and personal language. Howsoever different English speech is today from the way it was spoken by the people of Chaucer's day or Shakespeare's, both speakers spoke in a manner easily recognizable as English.[20] From historical grammar the psychological linguist can learn the changes which have taken place in specific language

[20] Cf. Hockett, C. F., *A Course in Modern Linguistics*, New York: MacMillan, 1958, Section 42, Phylogenetic Change, for a series of changes over a thousand years.

styles, a type of knowledge useful in understanding the patterning of utterances. Although the knowledge thus gained may also be interesting as well as useful, it must perforce be limited as there are great lacks in the total patterns which include gestures, pronunciation, and other features of active speech.

(e) Logic and Language In my book, *An Objective Psychology of Grammar*,[21] I criticized the great influence of logic upon students of grammar. At bottom, the objection is that the nature of logic is misinterpreted. On the one hand, logic is regarded as the rules of thinking or correct thinking, and therefore the general linguist presumes to determine how to express thinking properly or lucidly. There are two errors reflected here. The first is to regard thinking as psychic processes that are expressed by words. We have considered this erroneous psychological view in the first chapter of this book. The second error is to bind language and speech to the process of thinking in disregard of the enormously large series of actual situations of sheer referential performances.

The other misinterpretation of logic is to disregard its essential general system-building process and make it into the mere piling up of hierarchies of thing-particles into larger and larger thing-structures. In practice there is a tremendous emphasis upon organization, the syntax of elements in hierarchical or coordinate relations. Not only are sentences made into higher order systems than words, but also they are partitioned into subject and predicate, into noun phrase and verb phrase. Clearly there is here an overstress of things, blocks put together to form structures. This contrasts with the study of linguistic adjustments in which the behavior performed is correlated with the details of events as referents or indicators of what one might wish to communicate to others.

Psychological linguistics is in no sense opposed to logic when it is properly envisaged as system-building. In fact, it is always advantageous in keeping investigation in orderly control. Whether one studies a single language or a comparison of many, the worker is obligated to keep in systematic order a number of factors for example, the method of approach, the frame of reference, the information sought, the specific problems, freedom from tradition, and

[21] Kantor, J. R., *An Objective Psychology of Grammar*, Bloomington: Indiana U. Press, 1936, p. 8.

the general intention of the investigator. What it is decidedly opposed to is the employment of the many variants of logic based on a mind-body type of animism as this entire volume bears witness.

(f) Variant Postulations and Theories As a final item in our account of the extremely significant differences between general and psychological linguistics we consider the variations in basic postulations and theories.

What makes this comparison so important is that general linguistics has traditionally based itself upon nonscientific psychological premises, a procedure that erased the differences between the two subdisciplines. Obviously, however, if either type of linguistics is to be worthy of pursuit, it must be solidly based upon scientific data. Thus we are obliged to examine and analyze the contrasting underlying postulation and theoretical background of the two disciplines.

On the whole, general linguists adopt mentalism as the psychology of language. That results in the imposition of mind-body postulation upon linguistic events and their theories. As we have seen, entire systems of speech are constructed on the plan of words which somehow are connected with mental processes called meanings. There are two serious faults here. In the first place, language is made into fixed entities, perhaps of a sound-structure type, and in the second, linguistic events are conjoined with ghostly processes. Linguistics on that basis can never aspire to be a science.

To avoid the infirmities of psychophysical dualistics, some linguists have turned to behavioristic psychology. The striking example is Bloomfield, who adopted what he called a mechanistic view. The consequence of that was the upsurge of many difficulties with meaning problems. Meaning for him became the outside world, or things referred to. That put meanings of words outside the range of speech behavior. Furthermore, he propounded the unwieldy theory that speech was the sort of thing or event in which the speaker was stimulated while the hearer performed the reaction. "Language enables one person to make a reaction when another person has the stimulus." [22]

It appears quite evident that mentalistic postulation is thor-

[22] Bloomfield, L., *Language*, New York: Holt, 1933, p. 24.

oughly ingrained in modern culture. Accordingly, the antimentalistic view of the behavioral linguists was only a brief interlude among the prevailing linguistic theories. A Harvard professor of language explains why his book, *Aspects of Language*, has demanded a second enlarged and modified edition.[23] He argues that two forces, one of which is mentalism, have changed the study of language. It has done this in two ways. First, mentalism has emancipated theory. Whereas linguists in the first half of the century were reluctant to go beyond observation, linguistics now can build theoretical models. Again,

> if mind and intuition were real enough to be used in analyzing data, they were real enough to form part of the data. Mere linguistic behavior came to be valued less for itself and more for what it revealed about inborn capacities, or the genetic equipment for language—how it has evolved, how much of it is uniquely human, how it is manifested in the way children learn.

The second force is the social environment.

> Mind, inborn capacities, latent tendencies, are not enough. There has to be a power that wakens them and later guides them. That power is the social environment, with its expanding circles of family, playmates, school, and workaday associations, all shaping the child's inner drive for verbal expression.

If these remarks are shared by many general linguists, they pinpoint a great difference between general linguistics and scientifically based psychological linguistics. General linguistics overtly and covertly maintains animistic and mythological theories, while scientific psychological linguistics persists in studying language events as they occur and builds models drawn from observed events, and this despite the viability of animistic views. The viability of the animistic frame of reference reflects the tribute paid to venerable dogmas, even in the face of occurring events. This barrier to reasonable understanding has recently been exemplified by a plethora of autistic speculations concerning the nature and operation of grammar and language.

A brief description of what has been called transformational generative grammar illustrates the heavy emphasis that is placed

[23] Bolinger, D., *Aspects of Language*, New York: Harcourt Brace, 1975, p. v.

upon a "mind" explanation of language. Chomsky (1928–), and his colleagues in the generative grammar movement, propose to disregard the empiristic and positivistic philosophic postulation in order to return to the discarded rationalistic and intuitive style of thinking. They then espouse a spiritistic and mythical construct of mind. Upon this intellectual sand they erect the following set of autistic propositions.[24]

(1) The "soul" or "mind" is fitted with innate powers or competencies which determine, guide, and govern linguistic performances. It is owing to this innate and intuitive principle that children at an early age know and achieve grammatically correct sentence structures.

(2) The mind is furnished with a primary generative level of deep structures which generate the surface structures of language, presumed to involve semantic elements or rules such as subject-predicate, verb-object, as well as modifier-noun combinations. Surface structure consists of the actual sentences with their phonological components as ordered by the rules of deep structure.

(3) Since language is generated by a "mind" the development of speech by children is simply a matter of maturation. Here is a glaring misinterpretation of maturation based upon a false analogy. It is a false assumption that the development of speech is like the maturation of physiological acts upon the development of cellular structures.

(4) Language development consists of the ability to create sentences out of words by means of imitation and analogy.

How can Chomsky believe these fairy tales? No doubt by the self-assumed authority to make the study of language contribute to the understanding of human nature.[25]

It has often been remarked that the various pronouncements and doctrinal shifts of the transformationists display the traits of imperial ukases and in general that they invent observational and experimental conclusions without the benefit of behavioral evidence.[26] In this connection it is interesting to note the comments

[24] Cf. Chomsky, N., *Language and Mind*, New York: Harcourt Brace, 1968.
[25] Chomsky, N., *Language and Mind*, New York: Harcourt-Brace, 1968, p. 1.
[26] See for example, Herriot, P., *An Introduction to the Psychology of Language*, London; Methuen, 1970, Chap. III.

of Bowers who criticizes Chomsky for his arbitrary empiricism in deciding that the sentence "his criticism of the book before he read it" is ungrammatical while the sentence, "his criticizing the book before he read it" is grammatical. Bowers declares,

> Empiricism is an odd term to use for a method which leads to the conclusion that another native speaker's acceptance of an expression unacceptable by Chomsky is a result of the speaker's failure to note criteria of grammaticalness which are derived from Chomsky's private area of acceptability.[27]

To summarize the transformational movement in the context of comparing general and psychological linguistics, it must be stressed that this movement manifests the fulfillment of the thinghood of general linguistics, although the structuralism that it exhibits varies in some respects from the older forms in stressing sentences instead of words as the structural units. The tree analyses and its various modifications of sentence structures reifies meaning, referential, and other functions in addition to the phonological aspects of utterances. However, the contrast is great as between all such arbitrary abstractive treatments of language and the actual behavior of persons in specific expressive and communicative situations.

If justification is required for the treatment of such an involved and theologically tinged form of language theory, it is to be looked for in the social background of linguistics. Transformational linguistics has temporarily transformed general linguistics and the library-sized literature that it has provoked has marked a regression in an important field of study and so must be taken into account.

II. RELEVANCE OF GENERAL LINGUISTICS TO PSYCHOLOGICAL LINGUISTICS

Despite all the divergences between general linguistics and psychological linguistics, the two subdisciplines surely are very closely related, since both pertain to complex types of human behavior. Although the general linguist regards himself as the stu-

[27] Bowers, F., The Deep Structure of Abstract Nouns, *Foundations of Language*, 1969, 5, 520–523.

dent of word things—their composition and coordination—he must acknowledge that intercommunicative behavior is the matrix of all linguistics. There is, therefore, a symbiotic relationship between the two subdisciplines. This is true of both the historical and comparative branches of general linguistics. Each is benefitted from the labor of the other. In the following paragraphs we specify some examples of the benefits that general linguistics confers on psychological students of language. These benefits may be derived from the general, historical, and comparative aspects of language.

General Linguistic Orientation

Whether or not one agress that general linguistics is the most advanced of the human sciences, as some linguists hold, no one can underestimate its richness and importance. Linguistics in its various specializations clears the way to the appreciation of the intricacies of civilization. It teaches much about the behavior of human beings and their interrelations with each other as individuals and as groups. Not the least of its achievements is the orientation of scholars to the existence and development of a most significant body of events. Thus it may be expected that it can be of considerable value to psychological linguistics both in its comparative and historical phases.

Comparative Linguistics

The comparative branch of general linguistics supplies many details of importance to psychological linguistics. It informs students of linguistic behavior about the existence and variations of the four or more thousand different systems of language. Then there is all the valuable information about the influences of one system upon another. To follow the evidences of borrowing or independent origin of modes or style of expression offers invaluable knowledge concerning the details of the changes and variations in specific adjustments of people in different neighboring or distant geographical locations.

Probably one of the greatest lessons psychological linguistics can learn from general linguistics is the relationship between the behavior of persons, and the things and events to which language behavior pertains. Examples are the presence or absence of articles and copulas or the variation in the performance of such items in

speech. Languages like Russian and Chinese dispense with articles necessary in English and other languages. So-called analytic languages differ more radically in this respect from the incorporative languages which include elements representing great details of the things and events referred to.

Historical Linguistics

From the standpoint of psychological linguistics, historical studies of language are even more important than comparative data. In general, the study of the changes in linguistic forms and usages uncovers underlying behaviors when freed from the traditional layers of thing interpretations. Evidence of the service rendered by one subdiscipline to another is supplied by considering the evolution of forms or investigation of conditions or circumstances that facilitate the changes or developments.

Many additions to the forms, words, or compound expressions can be traced to definite circumstances including the behavior of individuals, but others cannot. It is not certain how such expressions as "OK," "right," "no way," "kodak," "so long," became added to the English lexicon, but it is clear that they point to acts of persons or cultural trends as the shared reactions of numbers of individuals. It is the latter type of change that accounts for the evolution of language systems from older established systems as in the proliferation of the Romance systems from the original Latin.

The importance of historical linguistics for psychological linguistics is highlighted by the changes in the "meanings" or usages of words from time to time. In the following table is an assortment of changes derived from various sources:

Samples of Meaning Changes

Historical	*Current*
Meat = food in general	fleshy food
Planta = sprout	plant
Electron (Greek) = amber	atomic particle
Pest = Bubonic plague	annoyance
Cadeau = capital letter	gift
Grasp = seize	understand
Knave = boy	criminal
Presbyter = older man	priest
Satellite = attendant life guard	entity related to other entity

Semantics

The important division of general linguistics called semantics, whether concerned with current or historical circumstances, offers psychological linguistics help in appreciating promising data. The nonpsychological linguist brings to light many traits of speech such as metaphors, metonymies, analogies, ambiguities, and uncertainties of "meaning." It is asserted that "the helicopter is over the hill" does not differentiate between being above the hill or on the other side of it.[28] This and many other examples indicate the need for being alert to the actual speech conditions and to avoid the abstractionism of words, phrases, or complex statements treated out of linguistic context or behavioral situations.

III. RELEVANCE OF PSYCHOLOGICAL LINGUISTICS TO GENERAL LINGUISTICS

General Relations of Psychology to Linguistics

Because language and its study both involve psychological factors, it is apparent that psychology is highly relevant to linguistic investigation. But the history of linguistics indicates that linguists have both affirmed and denied this relevance.[29] To go no further back than Delbrück (1842–1922) we observe his conviction that as between the then prevailing psychologies of Herbart and Wundt it does not matter which theory one espouses. He says, "Man sieht: für den Practiker lässt sich mit beiden Theorien leben."[30] This declaration is tantamount to the abjuration of psychology. In 1933 we find that Bloomfield, who turned radically away from the Wundtian psychology which he espoused in 1914, toward behaviorism which he called mechanism, refers approvingly to Delbrück's declaration and asserts that the study of language can be pursued without reference to any one psychological doctrine, and that to do so safeguards our results and makes them more significant to workers in related fields.[31] It is perfectly evident that Bloomfield

[28] Bennet, D. C., *Spatial and Temporal Uses of English Prepositions*, London: Longmans, 1975.

[29] For a substantial discussion of this problem see Kantor, J. R., *An Objective Psychology of Grammar*, Bloomington: Indiana U. Series, 1936.

[30] Delbrück, B., *Grundfragen der Sprachforschung*, Strassburg: Trübner, 1901, p. 44.

[31] Bloomfield, L., *Language*, New York: Holt, 1933, Chap. VII.

did not abide by this statement, but rather based his linguistics upon the behavioristic psychology of Weiss (1879–1931). Another example is provided by Ullmann (1914–), a specialist in the semantic aspect of general linguistics. This writer, sensitive to the mentalistic-behavioristic problem, declares,

> It would be unwise for the linguist to commit himself to any particular psychological theory. The exact psychological nature of meaning is of no outstanding importance to the linguist; he is more interested in the information which a word actually conveys to the ordinary speaker.[32]

Granting that linguistics is a science, it is of the greatest importance for linguists to be aware of the postulates and assumptions upon which the descriptions and interpretations are founded. Now since there is an inevitable connection between the psychological and other aspects of language, whether the data studied are presumed to be verbally produced, or somehow derived from such behavior, it is not only highly desirable but necessary to be informed concerning the psychological aspect. Certainly one must be alert to the great difference between primary speech adjustments and the resulting texts made from transcriptions of speech.

That it is optional for a general linguist to be sceptical or agnostic about psychology is a reasonable view, since traditional psychology is primarily mentalistic, but there is a different story when scientific psychology is in question. The option to take psychology into account or exclude it from consideration fades away. Interbehavioral psychology not only serves a necessary interdisciplinary function in the general field of linguistics, but also aids the appreciation of many, if not all, the specific problems of this most important activity of human and nonhuman organisms. Just as every worker is obliged to use only proper tools to accomplish satisfactory results, so linguists should be able to distinguish between a naturalistic psychology and an approach based upon either historical metaphysics or current reflexology. It is an interesting, but not delectable, experience to watch writers on linguistics build up a mentalistic cult because of their intolerance of reflexology. However justified they may be in their attacks upon the view that simple conditioning

[32] Ullman, S., *Semantics: An Introduction to the Science of Meaning*, Oxford: Blackwell, 1962, p. 61.

is the be-all and end-all of linguistic behavior, there can be no justification for proposing that supernatural processes can replace reflexology. Even if it were the case that conditioning or learning is of meagre relevance for linguistics, the substitution of theological soul and its putative intuitive properties is as useless as it is antiscientific and irrational. I conclude this chapter with a number of suggestions as to probable service that a naturalistic psychology can render general linguistics.

(a) Choice of Linguistic Models In science, models are not only useful but also informing. What kind of model is appropriate for linguistics? The answer, of course, involves the representation of the essential characteristics of speech as well as the purpose of the model maker. It follows, then, that the different interests of the model maker will influence what components will make up the model produced. I consider first the kind of model proposed by the communications engineer.[33]

Source—Message—Signal—Message—Destination

Admittedly, this is a highly specialized and abstract model, and may be taken to match well the essentials of a telephone conversation. Obviously, however, it is lacking all the important details that make up the nature and complexity of speech.

A simple model presumed to suggest the essentials of human speech is represented by a proposed psychological model as follows:

Encoding—Message—Decoding

This model raises a number of questions. What actually are the processes of coding, encoding, and decoding? It is not difficult to see that this is an abbreviated theologico-mental interpretation couched in different words.

This model cannot be made palatable by employing such terms as "storing in the brain" and retrieving "ideas" for their expression by means of vocal utterances. Fortunately, a scientific psychology of language can eliminate this type of model from the linguistic domain. While no model can do more than suggest the salient features of an event, I submit that the triangular diagram discussed

[33] Shannon, C. E., The Mathematical Theory of Communication, *Bell System Technical Journal*, 1948, 27, 379–423; 623–656.

in Chapter V offers a sufficiently serviceable index to the typical linguistic field event.

(b) Acts and Things, Context and Auspices Among the services psychological linguistics can render general linguists is the effective analysis of the various features falling under linguistic categories. First, of course, is the differentiation of acts, behavioral adjustments, and utterances from signals, word things, and strings of morphs. The understanding of linguistic phenomena in general depends upon the appreciation of unlike factors despite the common usage of names.

Another advantage that psychological linguistics can contribute to the general study of language is the differentiation of context from linguistic auspices. Excellent examples are available in the semantic phase of grammar. Instead of puzzling about polisemy—given words having various meanings—for example, "bank" as in the sentence, "The bank is solvent," "The bank is wearing away," "Don't bank on that"—one has only to consider the utterly different auspices under which linguistic acts are performed. No sort of verbal exegesis is helpful here, even with the evocation of contextual relations which apply only to word things or strings.

Although general linguists are primarily concerned with textual matters, they must be alert to the general background and origin of texts in the humanistic matrix of language. It is inescapable that the ultimate origin of texts or scripts is referential and symbolic behavior. Textual studies must be envisioned as a basis for orientation among the many aspects of language institutions in the complexities of human societies, and the behavior of the component individuals.

Because of the general linguist's interest in phonemics and phonetics he is bound to make effective contact with psychological linguistics, since the production of sounds consists of acts of individuals. To be sure, the study of sound-making yields little information concerning complex events of intercommunication; nevertheless it offers much information with respect to some specialized aspects of speech.

(c) Synchronic and Diachronic Confusions It is quite evident that scientific psychology cooperates very effectively in clarifying

problems of general linguistics. This fact is excellently demonstrated in the analysis of the problems of synchronic and diachronic language. Basically the problem concerns the relevancy of the historical aspects of language to the investigation of language at any current date. On the one hand, some linguists are sure that knowledge of the nature of language can only be effective when the history of language is included in its study. On the other hand, other linguists have argued that the history of a language, for example the descent of French from Latin, or general changes in languages were irrelevant for the understanding of current and immediate language or speech.

Favoring the latter interpretation, de Saussure, who proposed the terms "synchronic" and "diachronic" in his famous *Course in General Linguistics*, held by many to mark a new trend in linguistic study, persisted in separating the historical and current investigation of language. At the end of his posthumously published *Cours* he declared "the true and unique object of linguistics is language studied in and for itself." [34]

Synchronic linguistics de Saussure described as the study of current forms or signs as they exist on a timeless horizontal axis. The study of synchronic language provides acquaintance with unit elements and their combination into larger structures. All structures consist of forms static and unchangeable.

Diachronic linguistics emphasizes the evolutional and changing aspect of language. It is purely social and independent of individuals. Another characteristic is that it is the opposite of speaking.

> The study of speech is then twofold: its basic part—having as its object language, which is purely social and independent of the individual—is exclusively psychological; its secondary part—which has as its object the individual side of speech, i.e., speaking, including phonation—is psychophysical.[35]

While it is certainly possible to distinguish between current and historical language, psychological linguistics can only reject

[34] de Saussure, F., *Course in General Linguistics*, New York: McGraw-Hill, 1966, p. 232.

[35] Ibid, p. 18.

such a view as that synchronic language is purely psychic. The distinction really is between behavior and things as the products of behavior. As an exponent of mentalistic psychology, de Saussure's treatise is replete with ambiguities and even downright errors. No phase of linguistics more than any other events is change resisting. In general, then, psychological linguistics can throw considerable light on general linguistics as illustrated by de Saussure's treatment of linguistic problems. If the *Course*, as some believe, is the bible of linguistic structuralism, it shares with all bibles the frailities of imaginary constructionism.

The scientific psychologist sees clearly that to adopt a psychophysical dualism is to deny all acquaintance with facts. As we have seen, de Saussure is a confirmed dualist and so the really dynamic and changing aspects of language stem from the psychic side of signs. Linguistic signs for him consist of concepts and sound-images. "Language exists in the form of a sum of impressions deposited in the brain of each member of a community." [36] Moreover, de Saussure is imbued with the notion of collective consciousness or mentality. Even when he stresses strongly problems of structure, he departs widely from all activities of persons in communicative and symbolizing behavior. It is only psychological linguistics that can revise de Saussure's dictum that "natural data have no place in linguistics." [37]

(d) Universals and Absolutes An instructive instance in which psychological linguistics can illuminate general linguistics concerns the problem of universals and absolutes. What are called linguistic universals are such generalizations of features in speech as human behavior, and the similarities and resemblances of utterances, as that sentences consist of subjects and predicates, or noun and verb sequences. What scientific psychology condemns are the metaphysical implications concerning such entities. A scientific psychology eschews fanciful interpretations of what clearly are simply references to events and their organization. What are designated as universals are constructions arising from the observation that referring and symbolizing activities are adjustments to situations and circumstances.

[36] Ibid, p. 19.

[37] Ibid., p. 80.

Psychological linguistics makes plain that all such universals are merely blind verbal substitutes for actual conditions in linguistic fields. Uniformities and necessities in grammar or language in general are influenced by the events forming the referents of the communicative situations. Universals are derived from the similarities and uniformities in events conjoined with the styles of reference, to be found in different groups or communities. Psychological linguistics demands that appropriate notice be taken of the influence of concrete surrounding situations upon the order and acceptability of the morphology and syntax of grammar.

(e) Laws and Rules of Speech The history of general linguistics reveals a tremendous urge toward fixity, stabilization, and permanence. Outstanding examples are the exceptionless rules of the Junggrammatiker of the nineteenth century, and the internal rules of the transformational grammars of the twentieth century.

There are probably two main conditions responsible for the attempts to substantize language. One is the traditional origin of philology from textual studies. Grammarians have been stimulated to find rules and order in speech. The other is the actual fluidity and flux in the performance of communicative behavior. This pursuit of laws and rules makes of language something very remote from what occurs when communicative behavior is performed.

From the standpoint of psychological linguistics, all so-called laws, rules, and prescriptions are completely arbitrary constructions with little regard to actual linguistic events. Students of language substitute absolute laws and rules for the usages and conventions of references. Standards of speech or communication become established through usages based on various individual and social circumstances, and later govern the usages of language. Another means of reifying language rules is the embodiment of usages in written or printed documents which then appear as permanent prescriptions.

(f) Syntax, The Problem of Serial Order General linguistics, with its emphasis upon word elements, faces such problems as to how words are serialized into acceptable phrases, clauses, and sentences. Much mystery is attributed to the way words become organized into utterances deemed proper for the various language systems. Some grammarians puzzle over the problem of how children

can put together unit words to form correct and meaningful sentences. One suggestion is that sentences possess innate internal *structures* composed of meaningful elements or words. Now when even short sentences made up of meaningful elements comprise different messages the elements must be meaningfully arranged. John loves Mary carries a different message from Mary loves John. Obvious examples of the sequencing of words are found in profusion. Moulton (1914-) furnishes interesting items from the domain of language system comparisons.

> Consider the simple matter of asking a person what his name is. In English we say: "What's your name?" In French one must say what sounds to us like "How you call you?" (Comment vous appelez-vous?), in Italian, "How self call?" (Come si chiama?), in Spanish, "How self calls you?" (¿Cómo se llama usted?), and in Russian, "How you they call?" (Kak vas zovut?).[38]

Psychological linguistics offers a naturalistic explanation of the problems of syntax or word order. In the first place, attention must be paid to the fields or situations in which speakers and listeners are engaged at particular times. If William says "John loves Mary" he is referring to an event known or believed and no other combination of utterances can be performed in this situation. He could possibly say "Mary loves John" if he were acquainted with such an event, or believed there was such an event. From a scientific psychological standpoint syntax is not primarily a matter of words being put together but rather behavior of speakers performing communicative adjustments with referee persons and referents in linguistic fields. In brief, there is no mystery whatever in serial order or other arrangements of a communicative sort.

As to comparison between syntaxes of different language systems, that is a matter of historical and cultural evolution. Were the general linguist free of the notion that language or speech is a discipline mainly concerned with word-things, the historical grammarian might discover practical conditions which makes English stress tense, German put verbs at the end of sentences, and in general account for the variations in language behavior in addition

[38] Moulton, W. C., The Nature of Language, in Language as a Human Problem, *Daedalus*, Summer, 1973, p. 19.

to the genealogy of systems derived from known sources as French, Spanish, and Portuguese from Latin.

A word of caution must be interpolated here. It is no perversity that general linguists treat syntax as they do. The fact is they merely follow the prevailing views of logic and psychology. Accordingly, we must distinguish between psychological linguistics based on field axioms, and that based on the tradition of self or mind as well as that which interprets behavior in terms of cerebral functions more or less independently of total interbehavioral fields. It is only the behavior field viewpoint that can serve to remove the mysteries of serial order from syntax.

An excellent illustration of the difference between the field conception of the habitual or institutional orderly sequences of words in sentences and the contrasting views of mentalistic and behavioristic psychology is furnished by Lashley, (1890–1958), a behavioristic psychologist. Instead of explaining the variations between the Cree "kekaweechetusamikowanowow" and the English "may it remain with you" as linguistic behavior influenced by the many differences in the lives and cultures of the contrasting speakers, he proposes to see only the integration process of the cerebral cortex. It seems plain that the field view is not only of greater utility but also is in accord with language events.

(g) Participative Functions in Language Because of the complexity and many facets of language it immediately classifies as an interdisciplinary study. A satisfactory appreciation of speaking and symbolizing processes requires the participation and coordination of biological, physical, anthropological, sociological, and psychological aspects. This circumstance casts up a number of serious problems. How are the various aspects or phases of language related and how can the basic principles of each fit into a generalized view with proper account taken of a harmonious complex?

General linguists make much of the coordination of sound and sense, as in de Saussure's [39] signs composing a concept and a sound image, or Ullman's [40] reciprocal and reversible relationship between sound and sense in meaning. The writers mentioned assume that language or speech is confined to aural-oral behavior. Answers must then be found as to how air waves and vibrational phenomena which belong to physics are related to the psychological factors of sense? Again, there is the problem of how sounds or phones are related to the larynx, lungs, and other parts of the anatomy. There are many other cognate problems in connection with the societal components of language situations.

[39] de Saussure, F., *Course in General Linguistics*, New York: McGraw-Hill, 1966, p. 67.

[40] Ullmann, S., *Semantics: An Introduction to the Science of Meaning*, Oxford: Blackwell, 1962, p. 57.

Although this work is primarily concerned with problems pertaining to psychology, it is necessary to consider the relationships between (a) the physics of sound stimuli; and (b) the physiological and neurological activities of the conduction pathways of the nervous system, including the brain. As we have shown throughout this book, the conventional story that linguists have borrowed from animistic psychology, that the air waves stir up impulses in receptors (cochlea) which upon reaching the brain arouse mentalistic ideas or concepts is mythical. That kind of psychological component does not harmonize with the observed events when individuals speak or are spoken to.

Scientific psychology is committed to a participation principle with respect to the various components of speech behavior fields. As concerns the biological relationship to the psychological components, the functioning of the anatomical parts participate in a larger communication event. The acts of the organism involve also the participation of sociological and anthropological components which influence many aspects of referential behavior such as (a) what is said; (b) in what style; and (c) in particular circumstances. In no way can such factors be left out of any analysis of linguistic fields.

Chapter XXIV

Psychological Linguistics and Linguistic Philosophy

LINGUISTIC PROBLEMS OF PHILOSOPHERS

Among the most significant interdisciplinary relationships which psychological linguistics sustains with other studies one concerns the intimate connection of the psychology of language with the philosophy of language. This is the case with both (1) the general philosophical interpretations of linguistic events; and (2) the specialized linguistic philosophy developed under such titles as Analytic Philosophy, Logical Positivism, Semantic Analysis, Scientific Empiricism, Logical Analysis, Linguistic Analysis, and Logical Empiricism. I regard the philosophical aspects of language to be sufficiently covered in my various comments on general linguistics. As I have indicated, general linguistics is thoroughly impregnated with dualistic doctrines expressed in the coupling of words and meanings. In this chapter I shall be mainly concerned with the problems of linguistic philosophers as they attempt to free themselves from the fetters of metaphysics.

For an appreciation of the essential nature of linguistic philosophy it is well to refer briefly to its development. This brand of philosophy clearly stems from a dissatisfaction with the perversion of Greek metaphysics. For the Greeks (Aristotle), metaphysics consisted of naturalistic speculations extrapolated from available observations or inferences based on observations.

With the decline of the social and cultural institutions of classical times, and the rise of the escapist culture as propagated by clerics, metaphysics was converted to an exactly opposite intellectual industry. Philosophical speculations became alienated from confrontable things and events, and their observation, and turned into verbalizations and pseudodescriptions of non-natural and supernatural entitites. The subject matter of metaphysics became concerned with verbally invented powers and processes in illicit

simulation of descriptions of confronted events. The referents were mainly spiritistic entities that exist only in the words or symbols that presumably refer to them. Post-Greek metaphysics assumed and asserted the dichotomization of the world and man into material and spiritual essences.

LINGUISTIC SOLUTIONS OF PHILOSOPHICAL PROBLEMS

Despite the advancements of science and technology since the tenth century, spiritistic and ultra speculative metaphysics have never been entirely sublimated. However, growing philosophical sophistication has generated some profound objections to the purely religious way of thinking. Linguistic philosophy represents a formalized critical opposition to it. Thus philosophers in increasing numbers have concluded that the basis for erroneous thinking consisted of the wrong uses of language. Accordingly, a typical declaration of the new philosophy is the following.

> In philosophy one does not study physics, but the language of physicists; not political science, but the language of political scientists; not history, but the language of historians; not religion or theology, but religious or theological language.[1]

Linguistic philosophy was definitely born of excellent intentions and salutary motivation. It represents a clear appreciation that the grand succession of historical philosophical systems amounted only to the futile attempt to create ultimate and absolute transcendent universes. In consequence, the twentieth century witnessed the development of an immense school of thinkers who attempted to revolutionize philosophy by linguistic analysis of words, sentences, and propositions. Among the prominent members the following names, among many others, are well known: Russell (1872–1970), Schlick (1882–1936), Moore (1873–1958), Wittgenstein (1889–1951), Urmson (1915–), Carnap (1891–1970), Austin (1911–1960), Wisdom (1904–), Ayer (1910–), Feigl (1902–), and Reichenbach (1891–1953). These writers, however, have not accepted

[1] Attributed to Professor John Wisdom by H. B. Veatch in his presidential address delivered before the 69th Annual Western Meeting of the American Philosophical Association in Chicago, May 7, 1971.

identical views of analytic language, and thus have initiated various sects.

It is to be noted that each unit emphasizes some aspect of the common doctrine they prefer. It might be (1) the source of origin based on the admiration of mathematical symbols; (2) the need for precision of reference as influenced by early training in classical studies; or (3) the hope of improving philosophy by proper descriptions and categorization of concepts. Among other criteria or supports for favored language preferences are the need for clarification of propositions, or the construction of presumably perfect languages for improving philosophical study. I indicate five of these subgroups under the following rubrics.

FIVE VARIANTS OF LINGUISTIC PHILOSOPHY

(1) CLASSICAL LINGUISM

Under this heading I include what may be designated as the traditional semiotic view that unless one analyzes the meaning and sense of language he can mar his philosophical fortune. In the words of Russell, "the influence of language on philosophy has, I believe, been profound and almost unrecognized." [2] Actually there are two well-established traditions to nullify this pronouncement. One is the early form of analytic philosophy which was founded on the belief in the logical and symbolic perfection and precision of mathematical language. This phase of classical linguism is well known since Leibniz's (1646–1716) ascription of great potency to a universal characteristic to solve all intellectual problems. An example of a philosopher, aside from Russell, who strongly inclines towards this emphasis is Ayer.

The other phase of classical linguism stems from the English empiricistic philosophy in which reality is to be sought in the mentalistic domain of individuals. All abstractionism is presumably eschewed and in consequence powerful properties are allocated to words or language. For the entire succession of Locke (1632–1704), Berkeley (1685–1753), Hume (1711–1776), Mill (1806–1873), and

[2] Russell, B., *Logical Atomism in Contemporary British Philosophy*, First Series, London: Unwin & Allen, 1924.

those who follow in their intellectual train, words representing the personal experiences of individuals are taken as the guarantors of truth and knowledge, the while actual things and events are safely stored away in the minds or souls of thinkers.

(2) LINGUISTIC REFORMISM IN PHILOSOPHY

Since the particular emphasis of linguistic cults are functions of the cultural backgrounds of the members, we may well expect that philosophers with backgrounds in the study of ancient classical languages would urge an expansive reform of linguistic philosophy. They would seek for greater clarity in statements and propositions, and more effective measures for eliciting the meanings of symbols, words, or sentences. Critics of such programs of language reform assert that such linguistic improvements are only incidentally useful for philosophy, since the analysis proposed pertains only to individual items of language such as words, syntax, and idioms.[3]

(3) PHILOSOPHY AS IDEAL LANGUAGE

Linguistic philosophers considered as antimetaphysicians may well be expected to turn towards science and logic in support of their efforts to improve philosophy. Accordingly, linguistic analysts such as the Austrian philosopher Carnap have rallied to the proposition that "philosophy is the logic of science." [4] Implied in this proposition is the view that science and logic are both antagonistic to metaphysics. In the article mentioned, Carnap asserts that he is following Hume's prescription that since volumes of divinity or school mathematics do not contain abstract reasoning concerning quantity and number, nor experimental reasoning concerning matters of fact and existence, they should be committed to the flames.[5]

The upshot of Carnap's antimetaphysics is to believe that ordinary language as a basis for philosophical propositions cannot be rescued from the pitfalls of meaninglessness. Then resort must be

[3] See Urmson, J. O., The History of Analysis, Reprinted in Rorty, R. (ed.), *The Linguistic Turn*, Chicago: U. Chicago Press, 1967.

[4] Carnap, R., On the Character of Philosophical Problems, *Philosophy of Science*, 1934, 5–19.

[5] Hume, D., *An Enquiry Concerning Human Understanding*, Chicago: Open Court Publishing Co., 1912, p. 176.

had to move from inexact language to rigorous symbolism which is consonant in sentences, and as abstractive and general as mathematical symbols. Ordinary language invariably included meaningless factors. The remedy is to construct ideal languages for philosophical purposes. By means of such languages one can then construct a formal theory of the language of science, that is, the logical syntax of the language of science. Philosophy then becomes for him the syntax of the language of science, a syntax that can serve to construct the world.

(4) IN DEFENSE OF COMMON LANGUAGE

It is not surprising that among the participants in the discussions upon antimetaphysics there occurs the suspicion that linguistic analysis is not a panacea for the ills of philosophy. One demonstration of this is the development by the English philosophers G. E. Moore, Strawson (1919–), and others, that the reliance upon the common usage of words and terms is not a hindrance to obtaining valid philosophical results. The implication is that philosophy need not peremptorily depart from the world of everyday things and events. The claims of the empirical as over against the rational attitude are not to be denied as long as they do not imply that everything is reducible to mental states in a nonexistent mind.

(5) THERAPEUTIC POSITIVISM

A group of analytic philosophers emphasized the point that inept treatment of philosophical problems is owing to infections by linguistic confusions which like biological illnesses require applicable remedies. Wittgenstein, who is credited with the leadership of the therapeutic sect, in a most erratic and consistently contradictory style, constantly pointed out the shortcomings of speech, its fluidity, ambiguity, and polysemy. He himself, however, by his discussions of the diseases of language, provoked ideas concerning remedies that were far more disabling than the pathologies. One might conclude that Wittgenstein was proposing a clear posit that while the diseases of language were intolerable, the corresponding remedies, because of the ambiguities of the linguistic troubles, were quite futile. In this context it is interesting to be reminded of Wittgenstein's declaration in his well-known *Tractatus Logico-Philosophicus*,

> . . . the truth of the thoughts communicated here seems to me unassailable and definitive. I am therefore of the opinion that the problems have in essentials been finally solved.[6]

And also of his renunciation of the "grave mistakes" of the *Tractatus* in his posthumus *Philosophical Investigations*.[7]

Merit in abundance accrues to the movement in philosophy that advocates the careful and precise handling of the language of philosophy, as should be the case in every enterprise of speech or writing. However, it is certain that the ills of philosophy cannot be cured by the simple expedient of controlling language. A crucial question here is why, if metaphysics is eschewed, enter into the enterprise of improving ordinary language or inventing an ideal language of some sort? Related questions loom: what is language and what are its functions? What are the criteria of proper or effective language? Among the proponents of linguistic philosophy there certainly appears to be no universal appreciation of the precise nature of language either as general communication or technical description. An outstanding fault with the language postulation of linguistic philosophy is that language is presumed to consist of self-contained propositions or sentences that are independent of the concrete behavioral fields of thinking and reasoning. What is lacking is the appreciation of entire situations in which descriptions and interpretations play their part on the basis of problems, presuppositions, and rational conclusions.

CRITICAL ANALYSIS OF LINGUISTIC PHILOSOPHY

I turn now to a critical analysis of analytic or linguistic philosophy, and spell out the details of this phase of linguistics from the standpoints of science, philosophy, psychology, and linguistics. Unfortunately, I discover at once a number of weaknesses in all four of these aspects of linguistic philosophy. I consider the linguistic difficulties first.

[6] London: Routledge, 1922, p. 29.
[7] Oxford: Blackwell, 1953, Foreword.

A. INSUFFICIENCIES OF ANALYTIC LINGUISTICS

(1) Autonomy and Fixity of Words and Sentences

The perusal of writings on linguistic philosophy indicates clearly that this movement is concerned with conventional linguistics in which language is considered as objects or things and not psychological behavior. Of course, words and sentences as transcribed utterances or as symbols are products of behavior, but behavior and its products must never be confused. If they are, all sorts of misinterpretations must follow.

The fixation of communicative events in the domain of philosophy are easiest observed in the province of logic. There words become terms, sentences, and propositions. All three are manipulated as fixed independent objects in systems designed to establish proofs, beliefs, or truth. Logicians naturally had to deal with language as the vehicle for all arguments, questions about things, or the completeness and validity of assertions. Logical systems for them were structural organizations of linguistic items. Thus logic has been variously exalted as an autonomous discipline, and as laws of inference or reasoning capable of providing firm knowledge and absolute truth.

It should hardly be necessary to point out that the origin and development of logical work grew out of problems that had to be faced so that the use of terms and propositions were actually functional devices for securing conviction and for systemizing things and actions in specific circumstances.

(2) Relation of Language and "Reality"

Much of the fixation of language may well be ascribed to the analytic philosophers' notion of the necessary correspondence of language with some sort of relative or of absolute reality. As we have seen, analytic philosophers may favor a rationalistic or an empiristic attitude. But in either case, there is lost from view the fact that language is a definite type of behavior with distinctive functions, while the things, persons, and events referred to or symbolized consist of actual components of situations in which persons confront things directly or implicitly. It is such behavior and such things interacted with that contain whatever reality may be assumed. The acceptance of a relationship of fixed terms and absolute reality continues the historical metaphysical traditions.

(3) Misuse of the Conception and the Term "Meaning"

For the philosopher, meaning is the cement which attaches word or sentence things to the things and conditions of philosophical discourse. Accordingly, meaning is treated as an essential feature of linguistic philosophy.[8] As conventionally put, the basic philosophic question is "What is the meaning of a word or a sentence?" This question is illustrated by the distinction between analytic and synthetic propositions or sentences. In the former the meaning is presumed to be firmly fixed in the terms or words. When Kant declared the sentence "All bodies are heavy" is not analytic he thought no such tautological or inherent meaning is involved. The meaning heaviness or gravity is not contained in the concept or term "body."

Now clearly while some recent or current linguistic philosophers may reject the implied distinction of the a priori-empirical as metaphysical, they do not depart from the pseudopsychological notions of mind, mental concepts, and so on. This is indicated in the separation of words from meanings. What is so objectionable in the word-meaning dichotomy is the encouragement it allows to confuse descriptions and the described. Clearly, linguistic philosophers fail to appreciate that language, whether regarded as words or utterances, are only references or pointers to things or designata. Of course, in a literate culture, acts of utterance or reference become rigorized in alphabetic structures. They then become things, products of acts. Both the acts and the products are factors in complex fields which influence the character of each.

(4) Mistaken Notion of Meanings

To regard meanings as properties of words in association is to espouse fantasies. Meanings become on this basis transcendental essences or powers, residing in crystallized acts or derivations of acts. What is overlooked is that in standard or institutionalized

[8] As the Austrian philosopher Schlick held, philosophy is the pursuit of meaning. See Schlick, M., The Future of Philosophy, *College of the Pacific Publications in Philosophy*, 1932, I, 45–62.

words or terms the uses or manipulations of words have been initiated and carried out at some past time by one or more individuals. The model is the usage or rule in vocabulary or grammar in standard or proper speech. Examples are "meat and drink" which were used differently in former times. True it is that such meanings may become solidified and lasting, and thus appear as existing permanently, but the process of origin and continuation cannot be set aside. Furthermore, the "changes in meaning" are so constant as to be only deceivingly fixed.

B. INSUFFICIENCIES OF ANALYTIC PHILOSOPHY

(1) Linguistic Philosophy a Type of Metaphysics

Despite the claim of linguistic philosophers that their movement is and was designated to be antimetaphysical, it is nothing of the sort. Actually, linguistic philosophy is a distinct variant of classical metaphysics. Linguistic philosophy amply justifies the comment of Bradley (1846–1924) [9] to the effect that those who are ready to prove that metaphysical knowledge is impossible, are brother metaphysicians with a rival theory of first principles.

Basically, analytic philosophy maintains the traditional interest in such metaphysical problems as ultimate truth, absolute being, the a priori, self, mind, or soul, existence of other minds, private data, and so on. What it proposes is merely a "better method" of dealing with such alleged subject matter.

How enormously exaggerated linguistic philosophy becomes is implied by the view that philosophy is dissociated from concrete things and events, and is only concerned with the language used. The quality of language used is to be judged by such criteria as logical coherence, literal significance, and verifiability. A significant statement here is that of Ayer.

> Our charge against the metaphysician is not that he attempts to employ the understanding in a field where it cannot profitably venture, but that he produces sentences which fail to conform to the conditions under which alone a sentence can be literally significant.[10]

[9] Bradley, J. H., *Appearance and Reality*, Oxford: Clarendon Press, 1897, Second Edition.

[10] Ayer, A. J., *Language, Truth, and Logic*, New York: Dover, 1946, p. 35.

Now, although the writer quoted speaks of the metaphysician as transcending the limits of possible sense experience, he himself retreats from actual things and events as in the following statement.

> . . . the propositions of philosophy are not factual, but linguistic in character—that is, they do not describe the behavior of physical, or even mental, objects; they express definitions, or the formal consequences of definitions. Accordingly, we may say that philosophy is a department of logic. For we shall see that the characteristic mark of a purely logical enquiry is that it is concerned with the formal consequences of our definitions and not with questions of empirical fact.[11]

Howsoever much we may admire the intention of the linguistic analysis school to improve philosophical thinking, we cannot overlook their basic error of abstracting language from the actual human situations in which it occurs. Even when the philosophers are limited to texts or encoded propositions they presuppose that language consists of words sole or strings and systems of words plus meanings. We may well assume that philosophy cannot otherwise be revolutionized or improved except by thinking in terms of individuals or sets of individuals developing significant attitudes toward things and events that they actually confront. Only in that way can absoluteness, certainty, and transcendence be eliminated. Now we must consider some representative samples of language as dealt with by analytic philosophers.

The manners in which words and their meanings are treated in linguistic philosophy is indicated in the following excerpt from Wittgenstein's *Philosophical Investigations*.

> If one says "Moses did not exist," this may mean various things. It may mean: the Israelites did not have a *single* leader when they withdrew from Egypt—or: their leader was not called Moses—or: there cannot have been anyone who accomplished all that the Bible relates of Moses—or: etc. etc.—We may say, following Russell: the name "Moses" can be defined by means of various descriptions. For example, as "the man who led the Israelites through the wilderness," "the man who lived at that time and place and was then called 'Moses,' " "the man who as a child was taken out of the Nile by Pharaoh's daughter" and so on. And accordingly as we assume one definition or another the proposition "Moses did not exist" acquires a different sense, and so does every other proposition about Moses.—And if we are told "N did not exist," we do ask: "What do you mean? Do you want to say . . . . . or . . . . . etc.?" [12]

[11] Ayer, A. J., Ibid., p. 57.

[12] Wittgenstein, L., *Philosophical Investigations*, Oxford: Blackwell, 1953, p. 37E.

Language, according to naturalistic psychology, contrasts mightily with this emphasis of words or word combinations and the meaning supposedly inhering in them. It may appear that the linguistic philosopher veers somewhat away from this extreme treatment of words as things mysteriously associated with impalpable meanings when he realizes that the same words may contain or express different meanings for different persons. But this is not the entire story. The word-meaning interpretations of linguistic philosophy appear completely divorced from concrete situations in which individuals perform speech and symbolic reactions. This point applies to philosophical intercommunication as well as everyday language behavior.

From the standpoint of linguistic psychology no such differentiation between philosophical and common sense language may be stressed. That this point is not adhered to by linguistic philosophers arises from the fact that they unwittingly presuppose some sort of metaphysical principles which are very different from the ordinary circumstances of individual and social living. The above example by Wittgenstein lends support to the viewpoint of Ryle (1900–) and Ayer that the philosophers' business is rather to "solve puzzles" than to discover truths.[13]

(2) Maintenance of Venerable Traditions

Linguistic philosophy is not a single united movement but rather, as we have seen, consists of a number of sectarian units. Moreover, the participating members formulate and continually reformulate their own views about the essentials of their beliefs. Still, a decided unity exists among them in maintaining the traditional faith in the universality and ultimacy of philosophical pronouncements. None of the members of the brotherhood assimilates the view of philosophy as concrete orientation to things and events.

Specifically linguistic philosophies are concerned with problems of empiricism, rationalism, and in general the historical epistemologies and ontologies that have rendered philosophic discussion futile for several millenia.

[13] Ayer, A. J., Ibid., p. 26.

(3) Misconceptions Concerning Linguistic Functions

From the standpoint of this book, one of the most flagrant faults of linguistic analysis is the inveterate striving toward absolute validity. Semantic linguists hardly acknowledge the referential aspect of language. The interest in symbols was carried so far as to make them so abstract as to remove language from all connection with the world of things and events. Linguistic philosophers talk about the world, but they still do not appreciate that language is in both its referential and symbolizing aspects the activities of individuals when they react to present or absent objects, or to some qualities or properties of them. What escapes them is the fundamental point that philosophical reflection is a matter of knowing about things and events. What language consists of are responses which are in many cases purely metaphorical. Essentially, no reform or modification of words can effect the nature of things, but only the relations of persons to things and events. It is a great fault of philosophers in general not to concentrate upon the qualities of events that they are presumed to evaluate and interpret. Since it is not possible for an individual to reperform language responses in precisely the same way, it is to be noticed that variations in categories and descriptions may be classified as better or worse only for the purposes of understanding about the things confronted.

To ascribe to language functions so great a power as to correct the evils of historical speculation is to defy all probabilities. But this is not to deny that in philosophical language, as in ordinary grammar, there are criteria of excellence, and scales of propriety. Of course in philosophy, just as in ordinary grammar, standards vary, and so the conformity to the criteria of sufficiency or excellence has to do more with the personal attitudes of thinkers and not so much with the correctness of viewpoint with respect to the things and events to which one becomes oriented. What the emphasis of the function and power of symbols amounts to is the neglect of the things and events referred to or attitudinized about. What is just as bad is the consequence that signs, symbols, propositions, and statements are made identical with things signified.[14] This procedure goes back, of course, to the old solipsistic idea of transmuting

[14] Carnap has insisted that philosophic questions are only questions of philosophic language.

the world into one's own inner consciousness. We would expect that if Logical Positivism constituted a genuine improvement in philosophizing, it would shy away from solipsistic notions and from mental states and consciousness as well.

(4) Inadequate Logic

The abstractionistic and formalistic inclinations of the linguistic analysts lead directly to inadequate views concerning logic. Philosophy, they declare, is nothing but logic, and logic is nothing but the rigid conjunction of non-contradictory propositions or statements. When Carnap declares that "philosophy is the logic of science," and the ultimate aim of science is to achieve an ideal language, we may well ask what this sort of logic can do for the advancement of science or philosophy. It is a distinct failure of the logic of linguistic philosophy to comport well with the origin and history of logical pursuits. Since all phases of a philosophical system articulate with each other, it is not surprising that the logical phase should be as unsatisfactory and ineffective as it appears to be.

What is lacking completely in the views of the linguistic philosophers is that logic as it actually originated and developed consists of system-building. What materials are systemized, the goals of the system-builder, and the type of system products depends upon many factors. Above all, whatever formalism, fixity, and certainty, any system or system-building can boast, must be attributed to concrete circumstances, involving workers, resources, selected and valued criteria among others. Not the least of the items that the logician must be careful about are the working conditions and achievements of science, including psychology. To be familiar with the actual work of science and what it produces is a powerful antidote to the acceptance of traditional notions of logic and philosophy.

It is unquestionably the case that logic consists of system building, the rearing of structures out of things, actions, and any other object of interest, need, or want.[15] Thus, to limit the nature of logic to a single particular system, whether of words, propositions, or mathematical symbols, is to misinterpret the nature of logic as well

[15] Cf. Kantor, J. R., *Psychology and Logic*, 2 volumes, Chicago: Principia, 1945–1950.

as the linguistic forms or symbols serving as its constructional materials.

C. INSUFFICIENCY OF SCIENTIFIC WORK AND KNOWLEDGE

Since linguistic analysis was intended to be the effective opponent of metaphysics, it inevitably turns toward scientific thinking as arch antimetaphysics. But unfortunately, the linguistic analysts do not maintain a valid notion of science. Science itself is illigitimately reduced to a series of propositions or statements. This is tantamount to confounding linguistic description or reference including the accepted findings of scientific work with science itself. Science is a job of work—the attempt to ascertain the nature and operation of things and events. The latter consists of bodies whether taken as concrete objects, stars, clouds, cells, organic chemical elements or compounds together with their interactions and performances in definite fields. In no sense can the worker and his work be identified with the things and events he studies, and certainly not with linguistic references or symbolizations.

D. INSUFFICIENCY OF PSYCHOLOGY

Language being the behavior of persons or the products of such behavior, it behooves those who make language a central theme of their studies and contentions to be meticulous in their understanding and use of words, terms, signs, symbols, and combinations of such items. This does not seem to be the case. The great emphasis upon abstractness and emptiness of propositions in the interest of clarity and consonance serves to conceal the actual place occupied by persons in the philosophical enterprise. Plainly, analytic philosophers, like most philosophers in general, appear to be unenlightened with respect to psychology in its modern naturalistic evolution.

For this reason they overtly or implicitly operate under the misapprehension that the human organism consists of a mind and a body. This bespeaks a failure to observe that organisms are not envisaged as they actually are, but through the misty haze of metaphysical lore invented by the clerics of the early centuries of the Christian era. Hence their views are replete with fallacious notions, concerning concepts, sentences, definitions, and propositions.

CONCLUSION

The primary lesson to be learned from a brief examination of linguistic philosophy is the great muddle and ambiguity that arise when words, symbols, and the syntaxes of such items are regarded as autonomous objects. All sorts of ill-founded arguments can be constructed with such things as building materials. Many sects may be organized to formulate preferred beliefs in the analysis, use, and the significance of language. Examples are the puzzles extracted out of a simple proposition or statement, for example, "The author of *Waverly* was Scotch." Ayer gives as an equivalent "One person, and one person only, wrote *Waverly*, and that person was Scotch." Russell interprets this statement as equivalent to a conjunction of the three propositions, "At least one person wrote *Waverly*," "At most one person wrote *Waverly*," and "Whoever wrote *Waverly* was Scotch."

At the basis of such puzzles are the false dualistic assumptions that objects are either located in the "minds" of persons, or that they stand outside of "minds" but require mental assessment or interpretation.

In the light of the doctrines of this book, all the ambiguities and misinterpretations found in linguistic philosophy writings exist solely because of the neglect of the actual evolution of speech and symbology among people and the specific occasions of the utterances or transcriptions of contents, statements, or formulae of every variety. To profit from the lessons to be learned from the errors of linguistic philosophy, it is essential to be free from the logic, psychology, and philosophy that continues the historical mythologies ensconsed in these provinces of thinking and reasoning, as well as from the cultural exigencies that gave rise to them.

References

Abercrombie, D., *Elements of General Phonetics*, Chicago; Aldine, 1967.

Ayer, A. J., *Language, Truth, and Logic*, New York: Dover, 1946.

Baldwin, J. M., *Mental Development in the Child and the Race*, New York: Macmillan, 1907, Third Edition.

Baldwin, J. M., *Social and Ethical Interpretations in Mental Development*, New York: Macmillan, 1913, Fifth Edition.

Bennet, D. C., *Spatial and Temporal Uses of English Prepositions*, London: Longmans, 1975.

Bolinger, D., *Aspects of Language*, New York: Harcourt Brace, 1975.

Bloomfield, L., *Language*, New York: Holt, 1933.

Boas, F., *Handbook of the American Indian Languages*, 1911.

Bowers, F., The Deep Structure of Abstract Nouns, *Foundations of Language*, 1969, 5, 520–523.

Bradley, J. H., *Appearance and Reality*, Oxford: Clarendon Press, 1897, Second Edition.

Brain, R., The Neurology of Language, *Brain*, 1961, 84, 145–166.

Briones, I. T., An Experimental Comparison of Two Forms of Linguistic Learning, *Psychological Record*, 1937, 1, 205–214.

Bucklew, J., An Exploratory Study in the Psychology of Speech Perception, *Journal of Experimental Psychology*, 1943, 32, 473–494.

Carnap, R., *Introduction to Semantics*, Cambridge: Harvard U. Press, 1942.

Carnap, R., On the Character of Philosophical Problems, *Philosophy of Science*, 1934, 5–19.

Chafe, W. L., *Meaning and the Structure of Language*, Chicago: U. of Chicago Press, 1970.

Chomsky, N., *Language and Mind*, New York: Harcourt Brace, 1968.

Cofer, C. N., *Verbal Learning and Verbal Behavior*, New York: McGraw-Hill, 1961.

Cofer, C. N., and Musgrave, B. S., *Verbal Behavior and Learning*, New York: McGraw-Hill, 1963.

Cole, M., The Anatomical Basis of Aphasia as Seen by Pierre Marie, *Cortex*, 1968, 4, 172–183.

Darwin, C., A Biographical Sketch of an Infant, *Mind*, 1877, 2, 285–294.

Delbrück, B., *Grundfragen der Sprachforschung*, Strassburg: Trübner, 1901.

de Saussure, F., *Course in General Linguistics*, New York, McGraw-Hill, 1966.

Dillard, J. L., *Black English*, New York: Random House, 1972.

Dobzhansky, T., *Mankind Evolving*, New York: Bantam Books, 1970.

Donini, F., Review of *Libera Nos a Malo, Times Literary Supplement*, July 2, 1976.

Firth, J. R., *Papers in Linguistics 1934–1951*, London: Oxford U. Press, 1957.

Fouts, R. S., Acquisition and Teaching of Gestural Signs in Four Young Chimpanzees, *Science*, 1973, 180, 978–980.

Gardiner, A. H., *The Theory of Speech and Language*, Oxford: Clarendon Press, 1960.

Gardner, R. A., and Gardner, B. T., Teaching Sign Language to a Chimpanzee, *Science*, 1969, 165, 664–672.

Goldstein, K., *Language and Language Disorder*, New York: Grune and Stratton, 1948.

Goldstein, K., Speech Without a Tongue, *Journal of Speech Disorders*, 1940, 65–69.

Gorki, M., *Autobiography*, New York: Citadel, 1969.

Haugen, E., The Bilingual Individual, in Saporta, S. (ed.), *Psycholinguistics*, New York: Holt, 1961.

Haugen, E., *The Norwegian Language in America*, Bloomington: Indiana U. Press, 1969.

Hayes, C., *The Ape in Our House*, New York: Harper, 1951.

Head, H., *Aphasia and Kindred Disorders of Speech*, New York: Macmillan, 1926.

Herbart, G. F., *A Text-Book in Psychology*, New York: Appleton, 1891.

Herman, D. T., Linguistic Behavior: I. Some Differentiations in Hearer Responses to Verbal Stimulation, *Journal of General Psychology*, 1951, 44, 199–213.

Herman, D. T., Linguistic Behavior: II. The Development of Hearer Interaction with Holophrastic Language Stimuli, *Journal of General Psychology*, 1951, 44, 273–291.

Herriot, P., *An Introduction to the Psychology of Language*, London: Methuen, 1970.

Hinde, R. A., *Non-Verbal Communication*, New York: Cambridge U. Press, 1972.

Hocart, A., The Psychological Interpretation of Language, *British Journal of Psychology*, 1912, 5, 267–280.

Hockett, C. F., *A Course in Modern Linguistics*, New York: Macmillan, 1958.

Householder, F. W., *Linguistic Speculations*, Cambridge: University Press, 1971.

Hume, D., *An Enquiry Concerning Human Understanding*, Chicago: Open Court Publishing Company, 1912.

Jackson, J. H., *Selected Writings of John Hughlings Jackson*, London: Hodder & Stoughton, 1932.

James, W., *Principles of Psychology*, New York: Holt, 1890.

Jespersen, O., *The Philosophy of Grammar*, New York: Holt, 1924.

Kantor, J. R., An Analysis of Language Data, *Psychological Review*, 1922, 29, 267–309.

Kantor, J. R., Can Psychology Contribute to Linguistics? *Monist*, 1928, 38, 630–648.

Kantor, J. R., The Evolution of Mind, *Psychological Review*, 1935, 42, 455–465.

Kantor, J. R., An Interbehavioral Analysis of Propositions, *Psychological Record*, 1943, 5, 309–339.

Kantor, J. R., Language as Behavior and as Symbolism, *Journal of Philosophy*, 1929, 26, 150–159.

Kantor, J. R., Newton's Influence on the Development of Psychology, *Psychological Record*, 1970, 20, 83–92.

Kantor, J. R., *An Objective Psychology of Grammar*, Indiana U. Publications, Science Series, 1936.

Kantor, J. R., *An Outline of Social Psychology*, Chicago: Follett, 1929.

Kantor, J. R., *Principles of Psychology*, Bloomington: Principia Press, 1924–26.

Kantor, J. R., Psychological Linguistics, *Mexican Journal of Behavior Analysis*, 1975, 1, 259–268.

Kantor, J. R., *Psychology and Logic*, Chicago: Principia Press, 1945–50.

Kantor, J. R., The Role of Language in Logic and Science, *Journal of Philosophy*, 1938, 35, 449–463.

Kantor, J. R., and Smith, N. W., *The Science of Psychology*, Chicago: Principia Press, 1975.

Kellogg, W. N., and Kellogg, L. A., *The Ape and the Child*, New York: McGraw-Hill, 1933.

Kroeber, A. L., *Anthropology Today*, Chicago: U. of Chicago Press, 1953.

Lindzey, G. (ed.), *History of Psychology in Autobiography*, New York: McGraw-Hill, 1970.

Luria, A. R., *Human Brain and Psychological Processes*, New York: Harper and Row, 1966.

Malinowski, B., The Problem of Meaning in Primitive Language, in Ogden, C. K., and Richards, I. A., *The Meaning of Meaning*, New York: Harcourt Brace, 1923.

Marett, R. R., *Anthropology*, New York: Holt, 1911.

Martinet, A., *A Functional View of Language*, Oxford: Clarendon, 1962.

Martinet, A., Structural Linguistics, in Kroeber, A. L., *Anthropology Today*, Chicago, U. of Chicago Press, 1953.

McCarthy, D. A., *The Language Development of the Pre-School Child*, Minneapolis: U. of Minnesota Press, 1930.

McGeoch, J. A., and Irion, A. L., *The Psychology of Human Learning*, New York: Longmans, 1952, Second Edition.

Mead, C. H., A Behavioristic Account of the Significant Symbol, *Journal of Philosophy*, 1922, 19, 157–163.

Mead, C. H., The Mechanism of Social Consciousness, *Journal of Philosophy*, 1912, 401–406.

Mead, C. H., The Relation of Psychology and Philology, *Psychological Bulletin*, 1904, 1, 375–391.

Mead, C. H., Social Consciousness and the Consciousness of Meaning, *Psychological Bulletin*, 1910, 7, 395–405.

Mead, C. H., What Social Objects Must Psychology Presuppose? *Journal of Philosophy*, 1910, 7, 174–180.

Mistler-Lachman, J. L., and Lachman, R., Language in Men, Monkeys, and Machines, *Science*, 1974, 185, 871–872.

Moldavan, A., Vitamins? *Science*, 1935, 81, 639.

Morf, H., *Zeitschrift für Neufranzösiche Sprache*, 1888, 10, 199.

Moulton, W. C., The Nature of Language, in Language as a Human Problem, *Daedalus*, Summer, 1973.

Müller, F. M., *Lectures on the Science of Language*, London: Longmans, 1861.

Ogden, C. K., and Richards, I. A., *The Meaning of Meaning*, New York: Harcourt Brace, 1923.

Osgood, C. E., Suci, J. S., and Tannenbaum, P. H., *The Measurement of Meaning*, Urbana: U. Illinois Press, 1957.

Paget, R., *Human Speech*, New York: Harcourt Brace, 1930.

Paul, H., *Prinzipien der Sprachgeschichte*, Halle: Niemeyer, 1880.

Pear, T. H., *The Psychology of Conversation*, London: Nelson, 1939.

Peirce, C. S., *The Collected Papers of Charles Sanders Peirce*, Cambridge: Harvard U. Press, 1932.

Piaget, J., *The Language and the Thought of the Child*, New York: Harcourt Brace, 1926.

Pillsbury, W. B., *Attention*, New York: Macmillan, 1908.

Premack, D., Language in Chimpanzees, *Science*, 1971, 172, 808–822.

Premak, D., Intelligence in Ape and Man, Hillsdale, N.J., 1976

Preyer, W., *The Mind of the Child*, New York: Appleton, 1888–1890, 2 volumes.

Pronko, N. H., An Exploratory Investigation of Language by Means of Oscillographic and Reaction Time Techniques, *Journal of Experimental Psychology*, 1945, 35, 433–458.

Ratner, S. C., Toward a Description of Language Behavior I. The Speaking Action, *Psychological Record*, 1957, 7, 61–64.

Ratner, S. C., Gawronski, J. J., and Rice, F. E., The Variable of Concurrent Actions in Language of Children: Effect of Delayed Speech Feedback, *Psychological Record*, 1964, 14, 47–56.

Ratner, S. C., and Rice, F. E., The Effect of the Listener on the Speaking Interaction, *Psychological Record*, 1963, 13, 265–268.

Rorty, R. (ed.), *The Linguistic Turn*, Chicago: U. of Chicago Press, 1967.

Royce, J., *Outline of Psychology*, New York: Macmillan, 1903.

Rumbaugh, D. N., Gill, T. V., and von Glasersfeld, E. C., Language in Men, Monkeys, and Machines, *Science*, 1974, 185, 872–873.

Rumbaugh, D. N., Gill, T. V., and von Glasersfeld, E. C., Reading and Sentence Completion by a Chimpanzee, *Science*, 1973, 182, 731–733.

Russell, B., *Logical Atomism in Contemporary British Philosophy*, London: Unwin & Allen, 1924, First Series.

Sapir, E., *Language*, New York: Harcourt Brace, 1921.

Sapir, E., Philology, *Encyclopedia Britannica*, 1926, 13th Edition.

Saporta, S., *Psycholinguistics*, New York: Holt, 1961.

Schlick, M., *The Future* of Philosophy, *College of the Pacific Publications in Philosophy*, 1932, 1, 45–62.

Seymour, F., Black Children, Black Speech, Commonweal, 1971–72, 95, 175–78.

Shannon, C. E., The Mathematical Theory of Communication, *Bell System Technical Journal*, 1948, 27, 379–423; 623–656.

Shinn, N. W., *Notes on the Development of a Child*, Berkeley: U. California Press, 1893.

Silone, I., *Fontamara*, London: Methuen, 1934.

Steinthal, H., *Grammatik, Logik, und Psychologie*, Berlin: Dümmler, 1855.

Steinthal, H., and Lazarus, M., *Zeitschrift für Völkerpsychologie und Sprachwissenschaft*, 1860.

Stern, C., and Stern, W., *Die Kindersprache*, Leipzig: Barth, 1928, Fourth Edition.

Stevens, S. S., Notes for a Life Story, in Lindzey, G. (ed.), *History of Psychology in Autobiography*, New York: McGraw-Hill, 1970.

Sutherland, J. (ed.), *The Oxford Book of Literary Anecdotes*, Oxford: Oxford U. Press, 1975.

Taine, H., On the Acquisition of Language by Children, *Mind*, 2, 252–259.

Thompson, M. R., The New Active Principle of Ergot, *Science*, 1935, 86, 636–639.

Thomson, P., Washington's Second Language, *The Washington Post*, POTOMAC, Sunday, June 11, 1967.

Thorndike, E. L., *Man and His Works*, Cambridge: Harvard U. Press, 1943.

Tomb, J. W., On the Intuitive Capacity of Children to Understand Spoken Language, *British Journal of Psychology*, 1925, 16, 53–55.

Ullmann, S., *Semantics: An Introduction to the Science of Meaning*, Oxford, Blackwell, 1962.

Urmson, J. O., The History of Analysis, in Rorty, R. (ed.), *The Linguistic Turn*, Chicago: U. of Chicago Press, 1967.

Wegener, P., *Untersuchungen uber die Grundfragen des Sprachlebens*, Halle: Niemeyer, 1885.

Weisenberg, T. A., and McBride, K. E., *Aphasia*, London: Oxford U. Press, 1935.

Wilkins, J., *An Essay Towards a Real Character and a Philosophical Language*, London: Gellibrant, 1668.

Wittgenstein, L., *Philosophical Investigations*, Oxford: Blackwell, 1953.

Wittgenstein, L., *Tractatus Logico-Philosophicus*, London: Routledge, 1922.

Woif, I. S., Stimulus Variables in Aphasia: I. Setting Conditions, *Journal of the Scientific Laboratories, Denison U.*, 1958, 44, 203–217.

Wundt, W. M., *Völkerpsychologie*, Erster Band 2nd. ed. Leipzig: Engelmann, 1904.

Name Index

Subject Index