

AN ANALYSIS OF PSYCHOLOGICAL LANGUAGE
DATA

BY J. R. KANTOR

University of Indiana

I. The Problem of Language.—If we include under the heading of language all of its varieties of expressive and communicative behavior we will find language to be not far from our most pervasive form of action. Not a moment of our lives passes but that we perform a great many language reactions, either alone or in conjunction with other types of behavior. Consider that language reactions comprise not only speaking and reading but also are essentially involved in such complex behavior as musing, desiring, thinking, dreaming, planning and willing; in fact we might say that language responses not only constitute important exclusive adaptations to stimuli but parallel and complement almost all of our complex behavior.

And yet it is not incorrect to say that such widespread and important reactions as language consists of, have not been adequately treated by psychologists. True it is that Wundt has given us a two-volume treatise on language, but unfortunately that writer was mainly interested to place a structuralistic psychological foundation under the data of the philologist with the consequence that the treatise does not handle the facts of language as specifically psychological activities but rather as external manifestations of mental states or the social products of psychic processes. Likewise, the behaviorist has recently given some prominence to discussions of language, but he again has been merely concerned to establish the objectivity of thought by identifying it with expression; so that the behaviorist just as much as the introspectionist has foregone the treatment of language as distinct concrete adaptations to stimuli along with the other types of psychological reactions. In view of this situation

the writer undertakes an analysis of language reactions as prominent and significant data of objective psychology.

II. Differentiation of Psychological from other Language Data.

(1) *The Anthropological Data.*—Close study of language phenomena impresses us seriously with the extreme necessity of differentiating the psychological facts of language from other language data, for obviously, language phenomena constitute the subject-matter of several humanistic sciences. Is not language just as essentially a cultural fact, a matter of historical development, of social custom as it is a series of specific responses to particular stimuli? Now it is precisely the circumstance that language belongs to different domains of investigation which makes it difficult to keep separate the different approaches to language study, but which at the same time makes it so rigorously imperative that such a distinction between different data be observed. Penalties in abundance pursue us when we confound the different types of language data, for then we almost inevitably misinterpret our facts. When we ask what it is that makes especially difficult the distinction of psychological language from anthropological language we find this answer, namely, that the data of anthropological language, that is to say, language customs and traditions, constitute genuine though potential phases of psychological behavior segments, to wit, stimuli to language responses. To be more explicit, it is undoubtedly true that when individuals are about to develop language reactions such development is subject to the conditioning pressure of customs and institutions developed by their groups, but until such institutions actually function as stimuli to language behavior they cannot be called psychological facts. The difficulty in keeping anthropological language in the form of institutional and cultural entities distinct from psychological facts arises from the circumstance that group language institutions are often activities, but be it noted that such behavior must be looked upon as the abstracted activities of groups and their various influences upon one another and not as the concrete responses of persons to specific stimuli.

(2) *Philological Language Data.*—Much the same care employed in distinguishing between the psychological and anthropological phases of language must be exercised in keeping distinct the psychological and philological aspects. For philological data and interpretations have to do mainly with fixed forms of socially prevalent language institutions and their periodic variation¹ and not at all with the concrete forms of language responses such as especially concern the psychologist. And so we may say that the philologist gets no closer to the psychologist's data than does the anthropologist, although the philologist may be exclusively concerned with the facts of some particular language, and not languages as social institutions. That is to say, the philologist may also deal with the institutional stimuli of genuine language reactions but this is only one kind of language fact, and one which, unless it is contained in an actual response situation, or behavior segment, consists of conventions of speech rather than speech itself. When the philologist's material is not part of a behavior segment, such as the contents of a book when it is not being read, this material may be considered as a physical object exactly like any other kind of physical thing. Not incorrect is it to say that the philologist is interested in evidences of speech, spoken or written, as well as in standards of speech and only very remotely concerned with the psychological adaptations constituting language behavior, for the latter involves much more than is comprised in customary speech. To be brief, the philologist is essentially interested in fixed modes of phonetic systems and their symbolic representation and not in actual responses to stimuli.

Because the philologist is interested in conventional sounds and their symbolization his data and interpretations cannot be directly accepted by the psychologist. In the first place, many of the philologist's problems fall without the province of psychology since they have developed entirely as historical facts; among such facts are the problems of gender, the development of inflection or analysis and the absence of

¹ As exemplified by such laws as Grimm's, Grassmann's, Verner's, etc.

words expressing abstract ideas. In the second place, the philologist is moved by his interest in the conventional to **exclude interjectional reactions** or to think of them as evolutionary prototypes of standardized speech, in other words, to place too great emphasis upon standard words whether as roots or affixes or as combinations of the two. And in the third place, the philologist assumes that language is a series of symbols for the communication of ideas through definite and even logical vehicles, namely, **sentences**. To accept the philologist's material manifestly would put the psychologist at a great disadvantage for it would cause him to overemphasize the crystallized products and results of historical reactions and to pay scant attention to actual present behavior.

(3) *Psychological Language Data*.—In striking contrast to both of the above treatments of language, **the psychologist must look upon language as a series of intimate actions of particular persons, speaking, reading, listening, gesturing and interjecting, in short, adaptive responses.**¹ As a student of language the psychologist is not interested in the existence of language or languages even when those are considered as reactional products. That the psychologist's interest in language is a much more particularized one appears from the fact that even when the work of the anthropologist and **philologist** overlaps that of the psychologist, that is to say, when the former scientists handle language as psychological phenomena, they **deal with transmissive action only**, while the **psychologist**, on the other hand, must carefully take note of the **receptive aspect** of language also, to wit, **the receiving response actions** of language behavior.

In sum, from the psychological standpoint language comprises various sorts of adjustmental behavior, diverse adaptations to surrounding stimuli. Such reactions, in common with other types of psychological response, serve as definite

¹ And so it is entirely incorrect from a psychological standpoint to define language as "a system of signs, different from the things signified, but able to suggest them" (James), for while this definition does touch some psychological language facts namely, signs, it excludes the essential features of language and replaces them with the data of philology.

means of accomplishing specific results. In consequence, for the psychologist language reactions are unique personal and practically serviceable or expressive reactions. Whatever is common or standard about such behavior is due entirely to the commonness and institutional character of the stimuli which condition the acquisition of the specific phases of language reactions and which call them out when they are acquired.

77/. *What are the Psychological Characteristics of Language?*—Our first approach to a psychological investigation of language forces upon us the conviction that language is far from easy to define and therefore it is essential that we formulate as clear a criterion as possible to mark off language responses from other kinds of action. Upon reviewing many facts of language, we do arrive, however, at this distinguishing mark which we believe rather definitely divides off language reactions from other kinds of psychological facts, to wit, that language reactions are inherently indirect or referential adaptations to stimuli.

In order to examine and establish this criterion it is best first to contrast language reactions with some of the most direct and immediate forms of responses. Such direct responses are illustrated by simple reflex action or complex esthetic reaction to a picture or other work of art, as well as thinking about some thing or person. Such acts have no further reference to present or non-present objects or persons; nothing else but the one directly functioning stimulus and response is involved in the behavior segment.

Generalizing the fact of indirectness of action which characterizes language behavior we might say that language involves at least two stimuli, one the adjustment stimulus, the thing, event or person talked about, referred or otherwise responded to, and the other the stimulus object or person provoking the action, whether talking, thinking or some sort of overt behavior.

Illustrative of the indirectness of language behavior is the ordinary conversation or communication reaction. 'A' desires some object picked up; he therefore offers 'B' a verbal

or gestural stimulus which we may call the auxiliary stimulus, and which serves as the means to bring about 'B's reaction to the book which may be called for our present purposes the adjustment stimulus. What is essentially language in this situation is the indirect action which 'A' performs with respect to the object picked up. The specific means by which the indirect reaction is accomplished, whether through spoken words or pointing gestures makes no difference so far as the language features of the situation go.

Perhaps more clearly can we appreciate the operation of the indirect response when we alter our point of vantage from that of the speaker or the person who uses the language as an instrument to bring about an indirect response to a stimulus object, to that of the person who is involved in the actual carrying out of the reaction. Now while the second person adjusts himself directly to the stimulus object, say a book that he was told to pick up, he at the same time is involved in an indirect response to the request or speech stimulus.

But here we can imagine someone saying, "Is this action of picking up the book not a direct response on the part of 'B' to the request of 'A' as stimulus?" Considerable ambiguity we must admit to exist here, but we believe only with respect to the name of the stimulus. For observe, that it is hardly probable that 'B' is in fact performing a direct action to 'A,' but rather to 'A's request. But if the latter is true, then because the action of 'A' (the command) is a referential act, 'B' 's response itself cannot but refer to the book and hence the request is only an auxiliary stimulus, and if we do not allow this then we may still say that the person who gives the command is not like an ordinary natural object in his role as stimulus. To an ordinary natural object we can only perform direct action, both where the object serves as a substitution or as an adjustment stimulus, while in the case of the person his significance as a stimulus lies precisely in the fact that he can refer to things aside from himself by means of conventional signs, which he and those with whom he communicates, have developed in common

social situations. The two stimuli can equally well be analyzed when the person talks to himself as when he is reacting to another person. That means to say, that when I speak to myself about myself I am both adjustment and auxiliary stimulus to myself as acting person. Again, when I perform a direct reaction to some object, say a fright or startle response, to an automobile which barely misses striking me, that object or the accident situation may be both auxiliary and adjustment stimulus for a secondary or indirect reaction. It is possible of course that we can react directly to persons as we do to natural objects but in this case we should not attempt to consider any phase of the situation as language.

Whilst the form of language which we have just been discussing and which we name communicative may fairly be called typical it is not by far the most important or the most widely prevalent of our language behavior. But certain it is, however, that in all behavior properly denominated language we can distinguish the two stimulating situations or circumstances. And upon the particular mode of contact with these two stimuli we can in our opinion establish the criterion of indirectness for language reactions.

Two types of indirectness or degrees of language reactions may be distinguished upon the basis of what might be called from a biological or social standpoint the absence of direct adjustments to stimuli, or perhaps the absence of any overtly adjustmental behavior. To illustrate, language in the form of casual conversation may be considered from a biological standpoint as not adaptive at all, while language in the form of instructions or commands may be thought of as indirectly adaptive from the same standpoint. In general, we might name the two degrees of indirect action (1) mediative and (2) referential language. The criterion for distinction is the closeness to a direct response, the referential being the farthest removed. And so we might consider as referential all the language behavior which we call ordinary conversation and the exclamatory reactions which substitute for direct reactions. Now although it is true that in the case of some referential behavior a direct reaction to a stimulus is out

of the question, in the sense that it need never occur, as for example casual conversation, still the criterion of indirectness is just as valid in such cases as when some direct reaction is possible. Under the division of mediative behavior we can place all the language reactions which are in some form or other connected with direct reactions, that is, those responses which are instrumental in provoking direct action or closely associated with it.

Since in practice language responses may be said to be related to direct action in four ways, namely, they may precede, accompany, follow, or substitute for direct action, it may serve to illustrate the indirect character of language reactions to discuss briefly the four different ways in which language behavior operates. We will find that the language responses that precede, accompany, or follow direct action belong under the mediative heading, while the substituting type of language reactions we will call referential, in that it need not bear directly upon any direct action.

(a) *Language as Preceding Reactions.*—Various forms of preceding language responses may be isolated. A very clear-cut case is that in which language is used to induce some one to perform a direct action upon some object. Here we have the ordinary case of instructional or directing language. We may call this a practical or instrumental use of language. In other cases our preceding language may be the overt or expressed wish, hope, or plan to perform some action with respect to some stimulus object or situation. While for theoretical purposes there is no difference between this expressive type of language and instrumental speech, in our practical circumstances their variations turn out to be quite significant. And this is true whether or not the preceding indirect language act is or is not followed by direct action. In case the direct action does not occur or in case there is a definite certainty that it will not occur we must place this preceding act in the class of referential language.

(b) *Language as Accompanying Reactions.*—To illustrate language as accompanying or simultaneously occurring indirect reactions we may take the case of responding to a

picture by way of admiration or contempt and at the same time voicing or otherwise expressing or indicating what our direct response to this object is. Here of course the direct response may be the person's own thought or feeling responses which are accompanied by language expression.

(c) *Language as Following Reactions.*—What in many cases is very close to accompanying reactions may actually be indirect following responses and which may be very definitely determined by preceding direct responses. Exemplified are succeeding indirect responses in the act of telling someone what effect some object or situation has had upon one. The student who imparts to one of his companions the pangs he suffered during an examination is performing definitely succedent indirect reactions which are quite different from those indirect reactions which we assume to have accompanied the actual taking of the examination. To sing by way of glorifying, or bewailing what has happened are also indirect succedent responses. Of these succedent responses a large number may be subsumed under the heading of reference language reactions.

(d) *Language as Substitute Reactions.*—Let the reader observe that as a matter of fact our four conditions of indirect action resolve themselves into two general conditions. Indirect action (1) associated with (preceding, accompanying or following) other responses and indirect action (2) substituted for direct action. Our three aforementioned language types, as we stated in the beginning, belong of course under the first or associational heading and now we must illustrate indirect responses which substitute for or replace direct action. Substitutional language does not influence or need not necessarily have any influence at all on any direct action, nor on the other hand need such language itself be influenced by direct action, while in the associative type of language there may be such an influence. As an example of substitute reaction we may take the case of the person who, instead of rushing in to a burning building to rescue a child, may just exclaim in a variety of ways what he sees.

The indirectness of language responses as we have been attempting to establish it, can be very readily and very convincingly observed during the formation of language habits by the infant.¹ The observer must be struck with the differences between the language responses and the necessities and desires of the infant as well as with the specific responses of the infant in satisfying those wants or of the person who aids in their accomplishment.² The indirectness of the reactions can perhaps no better be established than by the reflection upon the numerous ways in which the language reaction can be carried out, especially if we consider the different language reactions of different groups and the varying language responses of the members of any given group.

Lest our emphasis of the indirectness of language reactions be thought too persistent we proffer the defensive suggestion that because our task here is that of definitely marking off one type of psychological response from other sorts of psychological behavior, we cannot be too exact in our descriptions. Especially is this true since not only are language reactions, like all other psychological phenomena, specific responses to particular stimuli, but they are not always morphologically different from other types of behavior. Of a surety when we think of verbal responses as language we cannot make many mistakes in differentiating what is, from "what is not language, but just as surely must we realize that verbal responses are not by far the only kinds of language reaction nor are indeed verbal reactions always language activities.³

More essential still does it appear to us to specify what are the differences between language and other psychological behavior because we summarily reject those traditional con-

¹ See Watson's excellent description, 'Behavior,' 1914, p. 329 ff.

² It is for this reason no doubt that Watson calls language reactions substitute responses, cf. 'Behavior,' 1914, p. 329 ff; 'Psychology,' 1919, p. 319 ff. We do not believe that substitution is a general characteristic of language reactions although such a description fits some language types.

³ For example, naming an object may no more be a language reaction than looking at it for all the laryngeal processes involved.

ceptions of language which make it, from a psychological standpoint, into either (1) mental states called meanings, which are transferred from one mind to another, or which are aroused in one mind by another through the medium of speech, or into (2) verbal or other physical manifestations of various sorts of mental states. From our objective psychological standpoint language cannot in any sense be considered to be a series of ideas or the expression or communication of ideas or other mental states.

To conceive of language as definite behavior phenomena not only gives us a much closer approach to the actual workings of such facts but it also enables us to include under the category of language, and to provide descriptions of, many sorts of specific adaptations that would otherwise be excluded. As to the first point, consider that we avoid completely such embarrassing problems as how it is possible for the same physical material (sound waves or light waves) to produce such different effects as do sensory and verbal stimuli.¹ Such problems the mentalist must face because he takes the media of stimulation such as light rays and air waves to be the stimuli themselves and so he must struggle to find a way out of this inexplicable situation.

When we think in terms of specific reactions to particular stimuli, whether persons, objects or events, we cannot subject ourselves to such insoluble enigmas. On the other hand, by rejecting the conception of language as an external manifestation of some kind of thought process we remove the necessity of limiting language action to such behavior as can be called intellectual or cognitive. All language need not fall under some sort of cognitive category as is the case when the declarative sentence is presumed to be the typical language function. By the same token language cannot be made into exclusive emotional or feeling expressions nor yet into expressions of merely the two kinds of states or experiences. Most serviceably and most validly must language reactions be considered as just such behavior phenomena as they happen to be, depending upon the way the stimulating

¹ Such a problem is raised by Warren, 'Human Psychology,' 1919, p. 321.

situations condition them. From this standpoint the language reactions may be named in any way esteemed suitable by the consideration of the behavior situations in which they operate.

With a myriad voices, though with no intention at all has philological science as well as popular thought celebrated the indirectness of language reactions. This characterization of indirectness has been achieved by looking upon language responses and their graphic representations as symbols of meanings and as indicators of concepts or ideas. To us it is manifest that no matter what view we take concerning the nature of concepts or ideas we must consider them as forms of implicit or incipient processes. For our own part, of course, meanings, ideas, and concepts are also definite forms of psychological responses. That philological science and popular thought do not intentionally make language into indirect behavior we say, because as a matter of fact the symbolic character of language does not lie in any reference to mental or psychic processes as popular psychology would have it, but rather in the instrumental or mediative function of language responses. Not all language is meaning behavior, but it is true that an exceedingly large amount of our language reactions serve as means or instruments for bringing about or for carrying on other types of action or otherwise accomplishing our purposes; so that the referential or indirect character of language has been generally observed and recorded.

How such observations were made we may infer from the fact that when anyone speaks of things or events not present, or asks someone to do something, he must surely note that his action is indirect and referential with respect to the absent thing or the thing the other person acts upon. Were it generally appreciated that ideas and concepts are merely implicit reactions to stimuli, that is to say, actual responses, then it might be overtly appreciated that language constitutes indirect reactions connected with concepts and ideas as direct responses to the same stimuli objects. But whether concepts, meanings and ideas are properly or im-

properly defined in popular psychology, the very fact that they are connected with language indicates clearly that language is fairly universally recognized to be indirect behavior, especially when the popular view concerning ideas and meanings are correctly interpreted, which means for us interpreted as definite behavior acts.

But here a very important problem presents itself, namely, **the connection of language and ideational or thought processes.** How are these processes in fact related? **Are they perhaps identical?** Such an identity indeed suggests itself through the circumstance that **both thought and language are mediate activities.** Recently this identification has been very strenuously urged in an attempt to show that thoughts (concepts, ideas) are not mental substances or psychic processes. Certainly from an objective psychological standpoint **thought cannot be considered as anything but adaptational responses to stimuli.** Because of the close relation and apparent similarity between thought and language it will add greatly to our understanding of language to compare it with thought processes and if it is not identical with it to mark it off definitely from thinking. To the study of this relation between the two kinds of behavior we devote the next division of our study.

IV. Distinction between Language and Thought.—That thought and language cannot be identified must appear a most valid conclusion to anyone who reflects a moment upon the actual behavior types which are represented by these two psychological terms. Consider that the term thought covers a large range of psychological activities, such as planning, problem-solving, judging, evaluating, inferring, etc. Can anyone meaningfully assert that these forms of complex reactions are language responses much as we may employ language behavior (though perhaps no more than all other sorts together) in accomplishing such responses? Only a moment's reflection is sufficient to recall most convincingly that the various forms of thinking involve so many and such peculiar contacts with stimuli objects of all sorts, and with instruments for handling them, that it is impossible to

call all such reactions language or even apply the term language to the typical phases of such activities.

In short, to call thinking language means rashly to overlook all the myriads of differences in the behavior situations. To name only one fact, is not language most typically, though obviously not exclusively, responses to persons as stimuli, but who would say that our thinking need necessarily have any close reference to persons or human affairs? Possibly one might be misled by the great place which printed and written materials play in our complex thinking and planning in the form of notes and records. To make the use of these verbal notes a basis for confusing thought and language is a grievous error. In the first place, what right have we to confuse verbal tools used in the process of thinking with that process or action, any more than we have to identify with thought itself any other tool (of which obviously there exists a great many) used in thinking. And in the second place, such a confusion of the records of thought with the activity of thinking itself is to mistake word symbols (which are no more language than any other sort of symbols) for the actual psychological process of language.

No one can deny that language is a most useful tool for the operation and development of our thinking; yet we must be so impressed with the fact that there are other modes of action which can be used in the planning, inferring and other thinking acts that we perform, that we cannot in any sense admit any general identity between language and thought. Even if we should admit, as we do without hesitation, that in some cases (perhaps not rare instances) the thinking and planning is purely linguistic (vocal or non-vocal, overt or implicit) we yet cannot allow the general identification, because thinking and planning may just as well consist of other kinds of reactions as well as words, or other kinds of language. Now as a matter of fact, in all cases of important or crucial thinking we have, since such behavior is initiated by and operates under the auspices of very complex situations, a host of reactions occurring, some of which may

be language responses, but certainly include others which are not.

If it seems plausible at all to believe that thinking is not language, even when we add that it is not always nor necessarily so, then we might see further ground for rejecting the identification from the fact that certainly language operates along with, or in the service of other forms of adaptational behavior, besides thought. For instance, in communication we use language to inform others of what we desire, hope, fear, and do (in the form of overt action) as well as to make known what we think.

Assuming that we agree that we cannot identify thought and language responses because each of these classes of behavior refers to what are on the whole intrinsically different adaptational functions, then of necessity the two types of behavior are different in the specific way that they operate. Unlike language responses thinking reactions are direct adaptations to stimuli, although some form of thought action, especially simple implicit behavior, appears to be indirect. It is this fact of the misconstrued indirectness of thinking behavior (since there are a great many of the apparent indirect types of thinking) which no doubt is in great part responsible for the identification of language and thought. In three general ways, then, can thinking acts appear indirect, each of which we must examine in turn in order to determine the exact relation of thought to language.

1. Because much of our thinking represents delayed forms of behavior, that is to say, because many specific reaction systems operate in conjunction with a number of different stimuli comprising the different angles of the thinking stimulus or situation, these specific responses may appear as indirect, but such is in fact not the case. Let us examine the possible reasons for such a misapprehension. In the case of thinking behavior there is present a temporal and spatial element involved in the complex action of responding to the various stimuli provoking the thinking response. The hit or miss character of thinking implies such a condition. For instance, a man determining in which of many manners he

can best ford a stream must probably make several movements or take several moments to decide upon the best way of doing it, but his reactions to these various stimuli are purely direct. On the contrary, in language behavior the one or the very few acts comprising the segment of action will all be indirect actions as we have indicated in the preceding section. The temporal disparity between stimulus and response which in thinking behavior provokes the opinion that such action is indirect when it is really direct, is wholly lacking in language behavior where the action *is* always indirect.

2. Again, thinking reactions may appear indirect through the fact that when they are most serviceable as adjustment responses they operate as precurrent thinking or planning reactions. Such reactions pave the way for a later reaction which will result in some definite change in the condition or existence of the adjustment stimulus object. The point is that thinking either precedes an overt action in the sense that the planning and deciding are accomplished before any actual work is done upon the objects and events with reference to which the thinking was done, or in a single segment of behavior the thought as a precurrent reaction system precedes the occurrence of the final or end reaction which it indeed conditions. In many cases, too, the characteristic of indirectness is attributed to thought reactions because no overt act at all need follow the implicit behavior. Our present interest is to point out that the implicit activity preceding overt action is in truth a direct response to the adjustment stimulus but because this reaction has to be aroused through the intervention of a substitute stimulus the immediate reaction must be thinking or implicit activity. But notice, that when the thinking or implicit reaction occurs, no matter how long before the overt act, it is itself a direct, though non-explicit response to the original or substituted-for object or situation.

In the case of language, on the contrary, our study has shown us that the adjustment stimulus object may be present and frequently is, when the language response is made, but the reaction to that object is referential and not direct. This

is true because the final response can only be made through the means of an auxiliary stimulus. At this point it seems only fair to admit that possibly our term indirect does not fit language responses any better than it is suitable for thought reactions, but there is no question concerning the fact of difference in the two cases irrespective of what name is employed to express that difference.

In the attempt further to elucidate the differences between the actual indirectness of language reactions and the apparent indirectness of thinking reactions it might not be impermissible to digress a moment in order to point out that although the temporal relationship of stimulus and response is not a criterion of indirect behavior still it is evident that the various instances of indirect reactions (language) may be differently conditioned by the temporal relation of response and adjustment stimulus. That is to say, the degree of indirectness depends upon whether the indirect language response follows a direct response or an implicit response. If language is associated with an implicit response the degree of directness or indirectness with respect to the adjustment stimulus will be greater than if it follows an overt reaction. As we have just stated it so happens that in most cases of implicit behavior the adjustment stimulus is responded to through the mediation of a substitute stimulus other than the adjustment object, and thus it happens that when an indirect language response follows an implicit action the person is doubly removed from the adjustment stimulus. This means, then, that in this instance there is a greater temporal interval between the connection of the language act and the adjustment stimulus than in the cases in which the language acts follow overt responses. If we may call any language response a response of second intention, then possibly it will not be unfitting to call a language response associated with an implicit reaction a reaction of third intention. Possibly an illustration might assist in clarifying this analysis. A person burns himself on a hot iron and his immediate and first response is a withdrawal act (reflex). Immediately following the reflex act he makes some language

responses (indirect) expressive of the pain he suffered. In this case the language activity follows an overt act (reflex) and is thus a language response of second intention. Later, this same person recalling the incident (implicit activity) communicates the details to his friend, or in other words performs a language response of third intention, since it follows the implicit activity of recalling the act of burning himself.

3. Possibly the most potent influence for identifying language and thought arises from the fact that thought is made identical with implicit action and especially because there obviously exists implicit language.¹ Now certainly some of our thought behavior may be considered to be merely implicit action, and patently language reactions are as much subject to implicit performance as any other sort of reaction, but these facts themselves contain arguments for not identifying thought and language. For observe that only a part of our thought behavior is merely implicit action, and furthermore, we have no more right to make implicit language synonymous with thought than any of the numerous other types of implicit action all of which may just as well as language be considered as thought. Moreover, as we shall presently see, implicit language cannot be considered as genuine language activity, and so while we might think of such reactions as thought we cannot think of them as language.

Now although implicit language must be considered to be non-problem-solving thought we cannot take such a fact to be indicative of the identity of language and thinking, since implicit language would be very little if at all serviceable for problem solving or any other active thinking process. In fact, it is possibly only in dreaming (day or night) that we perform implicit language activity to any extent and we need hardly comment on the striking contrast between such passive activity and the more active process of thinking. In all other cases than dreaming we can accomplish many things

¹ Is it not this shifting from thinking as problem-solving, to thinking as implicit action which lies at the basis of Watson's identification of thought and language? Cf. *Brit. J. of Psychol.*, 1920, 2, 89, et passim.

and more useful ones through the means of implicit non-language reactions (implicit construction, purchasing, etc.).

Granting that language functions most typically and most serviceably as psychological behavior when it is most overt, while thought as implicit behavior can be most serviceable to the person and operate most typically when there is a minimum of overt activity,¹ then we may find in this fact a further basis for disbelief in the identity of thought and language. We are convinced that language most useful for thinking must be overt activity, an instrument for contact with things, the actual handling of materials and not the pale reflection of conversation. It is really because of the overt character of language on the one hand, and the implicit character of thinking on the other, and not because they are identical, that overt language and implicit responses are so frequently operating in combination—so frequently, in fact, that it is even thought that they cannot operate separately. They cannot operate separately, it is said, in the sense that we cannot think without language, a statement, by the way, which may well be true in practice, but which carries with it no implication of inflexible necessity.² But at any rate, if it is true that language is more typical when overt, and much more useful for thought when so operating, then it is almost obvious that we cannot identify the two.

¹Here we must distinguish between implicit action of any sort considered as thought, and implicit thinking. The latter, of course, because of the absence of any adequate stimuli, is about as ineffective a form of action as we can well imagine. Brooding and dreaming are examples in point. No one of course will confuse such implicit thinking with thought that goes on in terms of implicit action, say implicit military operation, even though the latter can be contrasted with thinking in overt terms, as in the setting up of a complex original scientific apparatus.

²Otis, Arthur S., 'Do We Think in Words,' *PSYCHOL. REV.*, 1920, 37, 339-449, has excellently described a number of situations in which thinking is doubtless a distinct process from verbal language. While this author may not have successfully combated Watson's view which he attacks, because the latter does not limit his linguistic thought actions to verbal responses, we still believe that thinking, whether problem-solving or merely implicit action is not the same kind of psychological phenomenon as language. Perhaps it will not be considered too presumptuous of us to believe that, in view of our total rejection of any but an organismic hypothesis of thinking activity, Watson may not disagree with our practical functional distinction between thinking and language.

Provided that it is granted us that implicit behavior constitutes direct action to stimuli, may we not say that a clear distinction between thought and language is established ? And yet we must not be too sanguine of the validity of our argument. Those who still hold that thinking is implicit action may say, "But by implicit action in the discussion of language we mean sub-vocal behavior." Now sub-vocal behavior from the standpoint of our present objective position is of course indirect. Consequently, can it not be argued that thought as implicit or sub-vocal language behavior is therefore indirect and can be justifiably identified with language? We will immediately reply: Even accepting sub-vocal language responses as true language behavior, their functions in common with language in general, are usually quite different from thinking as we have already seen, and further, they need not in fact always be true functional language responses. Certainly when they are merely sub-vocally uttered words they seem to be purely conventional symbols. On the other hand, if one insists that sub-vocal actions are not considered true language but merely taken to be implicit action, then, as we have already argued, we have no more right to identify such implicit language responses with thought than we have to identify any of the other very numerous types of implicit action with thought. As a matter of fact, from our standpoint sub-vocal language reactions are not normally implicit actions but overt responses of expressive form.¹ In order to clear up this problem of what actually constitutes implicit behavior we might turn at this point to the consideration of such reactions. Preferably let us compare implicit action with actual language responses.

Implicit reactions comprise incipient or other forms of actually direct responses to objects which result in no immediate change of condition or existence in the stimulus object. Let us notice that the most typical forms of implicit reactions are partial or vestigial remnants of originally larger or complete reactions as is excellently exemplified in the partially implicit visual-perceptual reaction which may be considered

¹ See below the distinction between expressive and communicative language.

as the seeing part or phase, or remainder of the original seeing-touching or other whole¹ reaction system. The distinction, then, between an implicit and explicit reaction is a functional one. In other words, an implicit act may be morphologically exactly like an overt act, but owing to the absence of the original stimulus object no effect is produced upon that object. Now it happens that because of the absence of the original object, or because first contacts with objects produce disruptive and inhibitory conditions, the later contacts with the same objects consist of modified reaction systems. These partial or totally implicit reaction systems take on their specific character of implicitness because of the person's mode of contact with the stimulus in question and not in any sense because of their non-visibility or lack of openness to the inspection of the acting person or someone else.

In this fact of the interdependence of response and stimulus, which of course is an inherently psychological phenomenon, we find the differentiating conditions which not only mark off overt from implicit behavior but also supply us with criteria for distinguishing one kind of implicit behavior from another. Thus when the original stimulus object is present in its customary setting we react to it in the same overt way as usual unless some interfering condition arises. When the original object is partially present, as when we can see but not touch it, then we perform a partially implicit response. When the object is entirely absent and we are made to respond to it through a substitution stimulus we have or may have an implicit action which is totally different from the original act though definitely derived from it. In case the same stimulus object substitutes for itself, which is a common occurrence as when a person makes us think of an experience we had with him some time ago, the resulting form of implicit action can be clearly made out to be a result of responding to the person in a previous setting through stimulation of the person in a present setting. In

¹ Different, we should perhaps say here, instead of whole, because every unit of reaction is a reaction system.

similar fashion, if we keep in mind the relation of stimulus and response we can differentiate between feeling reactions and other types of both implicit and overt behavior. While the stimulus object is present in the case of feeling responses the reaction systems consist of the mild or vigorous agitation of the person himself without directly producing any change in the stimulus object or in the person's relation to that object. Of course we have implicit feeling reactions and here the response is a vestigial remnant of the original reaction system induced by a substitution stimulus.

Implicit action, we may say, then, seems indirect because the original stimulus object is not present, or is not present in the same setting; but in either case, as we have previously made clear, the response has a direct adaptive bearing upon the adjustment stimulus. Our assumption is that implicit behavior constitutes direct adaptive responses in much the same way as the more striking cases of inhibition responses compose direct adaptive behavior. Contrariwise, in the case of typical language the action is overt and results or may result in some change in condition or existence of the stimulus, but the reaction is indirect because it is referential. Illustrative of such a situation is the operation of instrumental language responses.

Once more we may return to the distinguishing criterion between thought as implicit action, and language, bringing to bear upon the problem the facts concerning the relationship of stimulus and response. We suggest that while implicit responses are mediate and secondary reactions, that is to say, involve two forms of stimulation as do indirect language reactions, the contacts of the person with those stimuli in the two cases are so different that we must consider the respective actions to belong to different types of behavior. Differences in action and name between direct and indirect responses are due to the difference in character of the additional stimuli. Now what is the exact difference between the two kinds of additional stimuli? Our assumption is that implicit behavior is always a direct adaptation in spite of the fact that for its performance is required a

substitute or additional stimulus. We call the additional stimulus substitutive because its only function is to call out the reaction to the adjustment stimulus, while the response is always made to the adjustment stimulus. Quite different is the auxiliary stimulus in language reactions which must operate along with and in synchronous addition to the adjustment stimulus. It is a genuine auxiliary stimulus operating as an integral factor in the total language activity. Furthermore we might even suggest that because in the case of implicit reactions the second stimulus merely substitutes for the adjustment stimulus, namely the thing or situation reacted to, there is really but one stimulus, while in the case of indirect or language reactions there are always two stimuli for any specific reaction system. We have no hesitation, then, in asserting that language is not identical with thought, either when thought is considered as planning or problem-solving or when thought is made into merely implicit behavior.

Further evidence and of another sort, to establish the non-identity of language and implicit action or thought may be deduced from the following consideration, to wit, that the two types of action as responses to the same set of stimuli may definitely parallel each other without any sort of interference or conflict. Moreover is it not true that we can *think* of something beyond and entirely different from the thing or circumstance of which we are speaking, a condition which would be impossible if the two types of action were identical, since the person may be employing all of his language or thinking structures and mechanisms for performing one of the two simultaneously occurring forms of response?

Still another fact militates against our identification of language and thought (as implicit action). It is this, that our language reactions as far as their actual mode of operation is concerned are definitely acquired through social stimulation, whereas our implicit actions, though they may be symbolized, are to a great extent merely functions of our individual contacts with our surroundings. This individuality of response, it may be argued, is not any more true of thought

than it is of language, for thought is also socially conditioned, but here the question arises whether we are not shifting our discussion from mere implicit action to the more complex forms of activity, namely, planning, or problem solving.

Neither thinking nor implicit action, then, is identical with language activity, and further, even if we agree that language is not inseparable from thought must we still say that language is the sole medium for the expression of thought or the actualization of implicit action?¹ Unhesitatingly we answer 'no,' and especially if by asking the question it is meant in any sense to establish any peculiar relationship between thought or implicit action and language responses. That thought need not be exclusively actualized through language is evident from the fact that because thinking is planning or problem-solving the expression of the reaction would doubtless occur in the form of actual overt responses made by way of changing some object or circumstance. Similarly, implicit action, being non-effective immediate action, would most likely have for its expression the actual initiation of some behavior affecting the previously absent and substituted for object which now has become available. Of a certainty, conditions are different in situations in which no final overt action is contemplated or possible, and in these situations the actualization of the thought or implicit action will be achieved through the medium of language. Possibly it may be objected that what we have referred to as actualization of thought is not what is usually meant by expression of thought, but what is meant by expression is rather communication or telling someone of what was thought. Certainly the communication of thought, although a very frequent form of human action, does not occur with such constancy considering the total number of possible cases of thought action as to make any thoroughgoing concomitancy possible. Very much of the thought of the world is set down in writing or expressed by word of mouth, but not

¹ 'Expression of thought' is a faulty term, implying as it does the embodiment of a psychic stuff or process. When properly used it refers to the employment of language or other action during the act of thinking or informing someone of what thinking action we have been engaged in.

all of it by far, nor perhaps half of it. As a matter of fact language being the typical form of indirect or referential behavior we can readily employ it in referring to our thought reactions as well as to all other sorts of actions and things. When communication occurs we must admit that we cannot conceive of any behavior that is in any sense nearly so effective for the purpose as is language.

Before concluding our discussion we might ask why should psychologists attempt to establish an identity or inseparable relation between thought and language? We believe the answer to lie in the suggestion that such an attempt is made in order to make thought a definite mode of psychological reaction and not an indefinite form of mental stuff or process. Admirable as is the motive for this identification and much as we approve of the attempt to bring psychological facts out of the clouds of unverifiable assertion, we must still withhold our assent from such an identifying procedure in the interests of other facts. What are the other facts? Briefly, all those complex and interesting developments and operation of the exceedingly effective indirect forms of psychological adaptation which we call language.

V. Modes of Language Reactions.—Because of the multiplicity of occasions for language adjustments and the consequent differences in their variety it is essential to provide some descriptive definiteness and order for such reactions. Two tasks especially here confront us. The first is to mark off what are actual language reactions from behavior which may closely resemble language and yet not be language. And secondly, we must distinguish between totally different modes of definitely established language reactions, for in failing to do this we might exclude from our enumeration of the facts of language authentic language reactions, as would be the case for example were we to confine language to merely verbal speech.

1. *Morphological and Functional Language.*—And first we must point out that upon a functional basis only can we accomplish our first classificatory purposes, namely to separate off language from non-language behavior. Even where we

find behavior which is morphologically similar to other kinds of unmistakable language activities we must withhold from it the appellation of language unless it serves a language function. To put it differently, it must serve as indirect reactions or adjustments. Suppose I wish to have my typewriter operate more smoothly but cannot make the necessary changes myself; I must let my wishes be known to someone who is able to do it. **My psychological adaptation is made by means of verbal speech or by pointing.**

In contrast to this definite functional operation of language behavior it may happen that I may utter perfectly formed words or perform other genuinely linguistic reactions which will not at all serve as instrumental or even indirect adjustment acts. These then we will exclude from the domain of functional language. An example would be **the words we utter as replacement reactions in emotional situations.** Along with the large number of reflexes which replace the absent final reaction system in emotional behavior segments we may utter words, mere verbalizations that are really acquired reflexes, which, owing to the fundamentally non-adjustmental character of emotional reactions, **no more adapt the person to his surroundings than do the reflexes.**¹

Again, the use of words by infants in imitation of bits of conversation overheard also illustrates what is perfect language morphologically, but what at the same time is not at the least language functionally. **It is possible also that words and phrases used by dissociated and otherwise abnormal persons (verbigeration) may exemplify morphological similarities to language responses but are certainly not themselves such behavior.**

When we turn to other than verbal language reactions the criteria between language and other forms of behavior cannot be so well made out, since there is not the sharp division there between morphology and function that there is in the case of vocal language reactions. But since we assume the criterion of language to be the question whether the person performs an indirect response we can at least

¹ Cf. Kantor, 'A Naturalistic Description of Emotions,' *PSYCHOL. REV.*, 1921, 28,19-42,120-140.

specify what are not language responses. For example, we can distinguish the true language reactions of the infant from its random acts that may be only morphologically language, if language at all. Thus the crying act of an infant may be considered both as a definite indirect action serving to communicate to someone its uncomfortable situation or as expressive of some such discomforting condition, but on the other hand the crying may be, from the language standpoint, purely random actions along with many other sorts of infant behavior which are merely indicative of superabundant energy.

And here an important suggestion surges in upon our exposition. In the form of a question it is this: what can we say of implicit language behavior, since by becoming implicit such behavior loses its function of indirect overt adjustment? To this query we can only answer that we must accept the dictates of hard facts and agree that implicit language is not language, precisely as we say that spending money implicitly or partaking of a meal implicitly is not spending or eating. In our opinion we cannot avoid this conclusion much as we may consent to the proposition that implicit language reactions are morphologically just like definitely overt language responses.

To balance, as it were, this exclusion from the domain of language of a whole class of psychological reactions we must propose the unqualified inclusion of interjectional reactions in the realm of language. Especially is this inclusion to be urged in view of the fact that philologists either exclude or attempt to exclude interjections from language phenomena or else they tend to minimize the importance of such behavior. Why they do this is plain, since interjections are not conventionalized as are other forms of language. From the standpoint of reactions, however, such behavior answers as definitely and as effectively to the criteria of language behavior as any other sort of language reactions. To be more succinct, interjectional language reactions function as means or instruments to express the conditions of the person induced in him by various surrounding persons and events.

2. *Expressive and Communicative Language.*—Within the field of functional language, that is to say, definite language reactions, we may introduce a distinction of great importance; we may divide language into two large divisions, to each of which we may apply a distinctive term or name, to wit, expressive and communicative language.

(a) *Expressive.*—In general, we might characterize expressive language behavior by indicating that it comprises the individual's adjustment to stimuli which do not necessarily involve any relationship to another person. Expressive language reactions we may look upon, therefore, as in a sense the most illustrative of our indirect responses, since the exclusion of persons removes the possibility of a connection between language and any direct adjustment. But observe that when the reaction results in leaving a record, such a record may become a stimulus for some direct action on the part of the person and in consequence the original action may be considered as connected with a direct action. To illustrate, as I react favorably to a painting in an exhibition I express my admiration by writing 'wonderful' opposite the catalogue number of the painting. This expression may become a stimulus for my friend to purchase the picture.

Is it not easy to see that expressive language better illustrates indirectness of response because of the passivity of the reacting individual? Expressive language activity is more of the nature of self-recording behavior, the registration of how some object, event or person has affected us or how we should like or hope to have an event turn out, etc. Contrariwise, the communicative language reaction may take place through any number of intermediate persons as is illustrated by the passage of an order down through an ecclesiastical or military hierarchy. Certainly we can no better put the matter in hand than to say that expressive language actions stand as responses only; they do not serve as stimuli for other persons as is the case with at least some of the communicative language reactions.

Indirect, expressive language certainly is, but still it may involve the elaborate employment of tools or instruments

(pen, picture) for its production, but here the instruments would be employed entirely to further the process of expression and not to effect some change in the adjustment stimulus object or to communicate in others the desire for such a change.

In all of this discussion let the reader beware, we are not using the term expression in the sense of a verbal or gestural manifestation of a mental state. Such a warning is doubtless superfluous from the standpoint of our exposition but the mentalistic way of looking at the matter is so prevalent that we cannot too frequently assert our departure from that tradition.

In quite another sense must we guard against a misconstruction concerning expressive language, namely, the idea that it expresses or is especially connected with emotions. In some sense this view is intimately associated with the general idea that language is the expression of mental states, for here it is assumed that an emotion is the mental state expressed. Now the patent reply to such a view is to assert that by means of expressive language the person performs actions involving what we may call ideas, desires, hopes as well as performing reactions that adjust him indirectly to events past, present or future. From the standpoint of the actual adjustmental situation expressive language is in no sense different from communicative language and in this statement we disagree with those who would make expressive language emotional as compared with communicative language which is assumed to be mainly or exclusively the expression of ideas.

Turning to the morphological feature of expressive language reactions we might expect, because of the commonness of verbal behavior, that expressive language will consist to a great extent of verbal reactions. But as a matter of fact, in comparison with communicative language, typical expressive reactions consist to a considerable degree of gestures of various sorts, facial expressions, smirking, sneering, crying, smiling, laughing, etc.

(b) *Communicative*.—In contrast to expressive reactions communicative language involves adjustment to some other person or persons and consists to a considerable degree of intentional and substitutive responses designed to bring about some change of an informational or overtly active sort in that other person with respect to the adjustment stimulus object or condition. We might indicate at this point that the criterion of communication depends upon the behavior of the second person rather than any result achieved by the first or stimulating person. In plainer words, we have communicative language when the transmissive or the first person's language reaction actually serves as a stimulus to arouse a response language reaction in the recipient. It follows, then at this particular point that the different phases of communicative language must be determined exclusively with reference to directly observable activities actually accomplished; that is to say, we need not consult the intentions or refer to the purposes of either person in the communicative situation. It is not a question whether they intended their language response to be heard or otherwise responded to. But we do not mean to exclude from our observations the distinction in communicative reactions between language spontaneously addressed to another person and language induced in the addressing person by a question or command of another individual. In the former case we consider the indirect reaction to be initiated by the adjustment stimulus (the thing spoken of) which reaction is then also conditioned by the auxiliary stimulus, namely the addressed person. The latter case, on the contrary, exhibits a reaction started off by the auxiliary stimulus (the person giving the command) which later, comparatively speaking, connects up with the adjustment stimulus (the object reacted to in the carrying out of the command). It must be observed, however, that the purpose of the first person is not essential as a characterizing feature of instrumental communicative language, for it may well be that my conversational reactions in which I relate to my friend the incidents of my trip abroad will serve as an instrumental stimulus for him to take the trip.

Purposes and intentions of individuals with respect to the adjustment stimulus do however make possible within the domain of communicative language the distinction between conversation and instrumental speech. Conversational language is communicative speech in which the trans-missive individual is not planning any definite direct action with respect to the adjustment stimulus, while in instrumental communicative speech such a purpose and intention is manifest. That the purpose or intention refers to the changes with respect to the adjustment stimulus and not to the actions of the speaker is hardly necessary to make a point of.

In suggesting examples of communicative language we might mention verbal speech, and possibly song and music, as well as gestures (pointing), printing, writing, telegraphy, signaling, of various sorts, etc.

Poetry and other forms of literary production when considered as language reactions partake of both the expressive and communicative forms of language. As references to the esthetic adaptations of persons they are of course expressive reactions, but on the other hand they do serve to arouse reactions in other people in the sense that the language responses (poems, for instance) of the first person are at the same time communicative as well as expressive. These reactions as reactions may intentionally or unintentionally, but not accidentally, on the part of the reacting person inform the stimulated person of some fact or condition by means of some symbolic or instrumental, or at any rate, some indirect action.

Receptive and Transmissive Communicative Reactions.—Very essential it is to distinguish within the field of communicative language behavior between the receptive and transmissive sorts of reactions, a distinction made imperative by the fact that communicative language is interactional, that is, it involves two persons. It may well be in many cases that we are speaking of exactly the same act or the same sort of action, but in the one case the actor communicates with some one, whereas in the other, someone is being

communicated with. Or we might say that in transmissive action the person's acts serve as stimuli to induce meaning reactions in a second person whose receptive action is at the same time a stimulus to the first person to perform a meaning action which again serves as a stimulus for the second, etc. In general, communicative language typifies the closest and most intensive interstimulation and interresponse activity.

Among the (1) transmissive responses we may name for illustrative purposes, speaking, writing, making signs, gestures, etc., while among the (2) receptive language reactions we may include hearing and seeing responses of all sorts.

As a final remark here it may be well to suggest that communicative language behavior is neither necessarily always more complex nor higher in the scale of human performances than the expressive language reactions. Quite the opposite, in fact, since some expressive language reactions such as poetry are by far as important as any kind of communicative behavior and certainly much more complex than most speech reactions. That this point is almost obvious is seen from the fact that much of the expressive action may be communicative as well as expressive.

In summing up the psychological facts which fall definitely under the heading of language behavior we find a large series of reaction types beginning with shoulder shrugging and other forms of gesturing which grow by combination and integration out of non-language expressive and manipulative actions and run up to the most complex and elaborate forms of verbal speech behavior.

VI. Types of Language Reaction Systems.—Not only can we differentiate between the various stimulus-response language situations as we did under the heading of modes, but we may also provide some arrangement of the vast amount of linguistic materials by classifying them according to the specific reaction systems involved. Naturally enough because of the similarities and overlappings in these reaction systems no hard and fast lines can be drawn between the different forms of language responses, still some order is

possible. Accordingly, we plan to arrange a series of **classes of language-reaction systems**, a series founded on the differences between communicative language and which cuts across the boundaries between communicative and expressive speech. We base our classification on the communicative type of speech on the ground that not only will a greater simplicity and definiteness be achieved, but also, because no form of language activity need be neglected since under communicative language is represented every form of language act. Our greatest line of differentiation then will be that between the transmissive and receptive modes of action.

I. *Primarily Transmissive Modes of Language, (a) **Vocal Speech.***¹—Very prominent in the list of all language reactions we find of course vocal speech. Not only has this type of language been developed as the most prominent form of expressive and communicative adaptation, but such language reactions have become connected with and instrumental to some of the most complex behavior of which the human being is capable. Vocal speech is an integral factor in all of our voluntary and thinking action, as well as our general social conduct. Under this heading we may place all the behavior phenomena which can be subsumed under the rubric of speech or talking.

In considering the graphic forms of sign and symbol making, that is to say writing and printing, we observe that a special virtue attaches to the fact that these reactions require an extension of the person's organic equipment for their performance. Not only can we thereby extend the scope of our immediate behavior as illustrated by the difference in transmitting information and other materials by word of mouth or gestures, but we also obtain thereby a more permanent record. It is not without the range of possibility that as Professor Warren² suggests, "the chief role of graphic language is to extend the range of communication

¹ It is not intended that this list should be arranged in the order of the importance of the reactions involved, since even in the absence of an objective standard it must be conceded that written language in cultured groups hardly stands second in functional value to vocal speech.

² "Human Psychology," p. 319.

in space and time." Think only of the information concerning ancient civilizations which the people of those times have supplied for us through the instrumentality of signs on bricks, clay tablets, monuments, etc.

(b) *Vocal Gesture*.—The vocal apparatus of the human individual not only is the instrument for our fully developed speech reactions but also for the simpler vocal gesturing, such as calling, crying, whistling, sighing, grunting in infants, singing and other forms. Vocal gesturing, while ordinarily expressive language behavior, can also function as definitely communicative expressive language reactions.

(c) *Sub-vocal Speech*.—Besides the overt and complete language behavior we have many kinds which are not audibly performed. Among such reactions are the silent speech and silent reading responses and more typically perhaps those language activities serving as phases of what are known as "mental" arithmetic, etc. By far the most of our complex behavior such as planning, brooding and various forms of thinking include many various forms of sub-vocal language. The student of language may well question whether these reactions may be considered as primarily transmissive, since we can very readily think of numerous instances in which they serve receptive functions, but in view of the fact that self-communication, in which they are transmissively employed, is so common, we include them here.

(d) *Non-Vocal Gesturing*.—Much of our language behavior goes on in the form of gestures; in fact since under this rubric we include most of the language reactions not involving vocal or verbal behavior the field of gestures is very large. Such behavior comprises a great variety of forms; here we have deaf and dumb language, the shoulder shrugging, facial gesturing and the movements of various parts of the body, eyes, arms, hands, head, etc.

Gestures are not only primary and exclusive language adaptations to various stimuli but they also function as adjunct responses along with other language reactions. Thus the motions of fingers, hands and arms, the shrugging of the shoulders and numerous sorts of facial expression may

constitute the more or less essential accompaniments of vocal speech. So important are such accompanying reactions in many cases that without them the vocal reactions carry little or no significance. A field experiment in this connection involves the observation of the degree of understanding which we derive from listening to conversation both when it is and when it is not accompanied by gestural responses.

Possibly it is not beside the point to assert that gestural language represents almost every phase of human adjustment to stimuli. It may express and communicate thought, feeling, desire, the state of health, kind of disease, activity, and other forms of adjustment. By language gestures we perform almost every sort of adaptation that we can otherwise execute.

(e) Making Signs and Symbols.—Very numerous are those language reactions requiring some extension of the organism's natural equipment for their execution. While vocal and bodily gesturing involve merely our own elaborate organismic equipment other forms of language behavior involve the use of instruments such as a pencil, pen, graver, pennants, type and paper, skins, stones, and other impressible materials as well as sound-making (telegraph) and other types of mediating tools. Such instruments are employed not only for our own personal activities but also for our complex social responses since the most important technical and scientific information can be intentionally conveyed by the use of such instrumental reactions. Most interesting is it to observe that the language reactions in which we employ tools for sign-making are not in principle different from our complex verbal reactions. The latter also involve definite autonomous tools or instruments, that is to say, sound combinations or symbols. Are not the entire set of materials with which the philologist deals formal symbolic tools employed by specific groups of individuals as media of intercourse, tools which are modified and developed to suit their own specific needs? In comparing sign and symbol language with verbal responses we find the greatest difference to lie merely in the fact that the latter are performed exclusively with our own organismic

equipment. Examples of this sign-symbol class of language responses are writing, printing, picture drawing as in the case of the cave dweller, using codes of all varieties, stamps and flowers, also wigwagging and signaling of all sorts.

While expressive language is not excluded from this type as witness the inclusion of picture and other forms of writing, these reactions on the whole serve to convey in a more formal manner than expressive behavior our ideas, wants, desires, etc.

II. *Primarily Receptive Reactions*.—While as a matter of fact the receptive language reactions consist mainly of definite seeing and hearing responses we might generalize all of the characteristically receptive reactions and group them under the heading of understanding. In so doing we not only generalize all the specific reactions but we separate off the understanding reactions which are precurrent to or anticipatory of final language reactions from the latter. This separation is made possible primarily by the fact that in the majority of cases the seeing or hearing acts are precurrent understanding reactions which may accompany other precurrent acts of an implicit or partially implicit nature, while the end reactions in a language behavior segment are overt reactions. We might point out also that the justification for separating the understanding reactions from the rest of the behavior segment lies in the possibility it affords us of a better comprehension of the whole series of factors.

Understanding responses are meaning reactions. That is to say, they function as means to the performance of some other act, and may be roughly said to consist of a realization or discrimination of the stimulus object or condition. This realization makes for an appropriate final response. The degree of realization ascribable to the meaning response depends upon whether the precurrent reactions in a behavior segment are or are not exclusively overt. As a matter of fact, the simplest sort of understanding reaction is one of which there is no discernible precurrent reaction at all but only the one overt reaction system. Such a case is illustrated by the incident in which pulling the hand away is practically

a part of the hearing of the admonition to "look out for the saw." Or we might say that a simple reaction system includes the linguistic hearing act plus the reply, with whatever language that contains. If the stimulus calls out definite precurrent acts, but only overt ones, as is the case when we first exclaim, "Oh, a saw," and then pull our hand away, we must assume that there is a greater degree of understanding or comprehension of the situation involved. Even more understanding or comprehension of the stimulating situation must be ascribed to the precurrent receptive language reactions when they accompany or precede thinking actions. In these cases we have very complex behavior segments or behavior patterns which are combination thinking and language reactions. We wonder whether it is not owing to the strikingness of these complex combination responses that the mistake can be made of identifying language and thought. The reader must observe that in all of our illustrations we have assumed that the language reactions are indirectly adapting responses connected with direct overt and implicit responses. Such are the typical ways in which our language reactions operate, for they are in the final analysis always definite adaptational reactions and are thus conditioned by the stimulating auspices. Further, it must be observed that although in our illustrations we dealt with language understanding responses serving as precurrent functions such reactions may themselves be final responses.

(a) *Reading and Comprehension¹ Reactions.*—To turn now to the more specific receptive language reactions we find here a series of specific types of understanding responses to a variety of different stimulating situations requiring different modes of contact such as visual, auditory or other sort. Reading, for example, covers a series of responses to language stimuli seen, while comprehension composes a number of responses to sounds heard, as in listening to verbal speech or other sound stimuli. The reaction systems operating here

¹ In the absence of a word to represent understanding responses for auditory stimuli corresponding to reading for visual stimuli the writer follows Professor Warren in using the term comprehension in a slightly technical sense. Cf. Warren, 'Human Psychology,' p. 320.

involve especially the visual and auditory receptor mechanisms, the optic and auditory neural pathways, localizable cortical mechanisms, all sorts of muscular mechanisms (eye, head, chest, laryngeal) and various speech processes. These different specific comprehension and seeing responses, it is well to observe, may involve different orders of action on the part of the responding individual. The stimuli of the comprehension and language reactions may be (1) intimate internal mechanisms in the sense of actual speech, or (2) partially external mechanisms as in the employment of signs or (3) mainly non-organismic mechanisms as in writing to a person or printing material for him.

The term reading, let us note, covers not only the ordinary acts of perusing print but all forms of visual reactions to linguistic stimuli. Thus, we may speak of reading facial expressions and gestures of all sorts besides lip reading in its various forms. In all these cases reading constitutes adjustment responses, while in other situations as in vocal speech conversation the reading of expression and gestures constitutes auxiliary reactions either as (1) additional responses to the speech stimuli or (2) as direct reactions to gestural expressions serving as the setting factors of the vocal speech stimuli.

What is meant by hearing is more definite and familiar and requires no further comment with the exception that we might suggest that just as in auditory reactions we find auxiliary visual components so in visual language reactions we may find auditory components, for example, implicit reactions to sound stimuli. As our last sentence indicates, we may think of reading as a general name for visual receptive language reactions, while the term comprehension serves in a similar capacity for all receptive auditory responses.

(b) *Tactual Receptive Language Reactions*.—Reading and writing constitute what we may well call the normal and usual forms of receptive language reactions. Besides these types we find also, though in unusual cases only, that tactual reactions are also made to the transmissive reactions or language stimuli. Examples are the reactions of the deaf and blind to the lip movements of other persons and to the raised types of blind printing.

VII. The Varied Character of Language Phenomena.— From our study of language phenomena we may readily derive the notion concerning the multiple character of such facts. Not only is a language response a definite adaptation to stimuli but it may at the same time itself be a stimulus for another response. Moreover, as we have already intimated, it is necessary to separate the psychological facts of language from the physical, social and other phases of language and incidentally bring into sharper relief the functional and dynamic character of language. Probably we can best accomplish this our present purpose by analyzing a word.

1. *Non-Psychological Language Words.*—(a) In the first place, a word may be considered merely as a purely physical or natural object which exists in nature exactly like any other physical thing and with the same characteristics. Here we mean to refer to a printed word (as it stands unread in a book) for example, or to a sound. Now of course in contrast with a physical object such as a stone we might say that the word as a physical object was invented or developed through some human agency, but this difference between a stone and a word is only relative, for surely all of the stones in our urban environment, at least, have been somehow transformed or modified through human agency, but this in no degree minimizes their physical or objective character.

(b) A word may be considered also as a human institution and now we refer to the word as a member of a specific series of language customs. Here the word has a very different potential function but still it may exist totally unused and little known. Such instances are all of the words in the Moeso-Gothic language which exists only in the Bible version made by Bishop Ulfilas.

(c) Another type of word which belongs to the class of the two previous words, namely non-psychological data, is the uttered word under certain circumstances. Now we are thinking of the word act, the act of speaking a word, which is merely morphologically language but not functionally so. Here we have random vocal actions which do not function either as an expressive or communicative adaptation. For

instance, such a word as that uttered by a person when under the effect of ether. While these are undoubtedly psychological acts instead of natural or physical objects they are not data for the psychologist of language nor do they belong to the domain of psychological language behavior.

2. *Words as Definite Psychological Data.*—All three of the words we have just discussed may be considered as things and acts, but not as serving any specific language function; they are independent of any immediate language use. We will next consider the words serving in some sort of language adjustment. Now let it be understood that in this case we may still be referring to these other words but now they are, psychologically speaking, in some functional relationship. From a psychological standpoint it is only in case words are in a stimulus-response relationship that we think of them as definite psychological data. We may differentiate then between the following forms of stimuli and response words as psychological language data.

(a) *Words as Stimuli.*—Here we may speak of a printed word which serves as a definite stimulus to arouse a language response in some person, any kind of physical word which calls out an indirect reaction. This word we may look upon as a symbol, which presumably with or without the intention of anyone at this moment calls out a meaning or language response in some person.

Also under this division we have word acts serving as stimuli language functions. Here we include definite verbal utterances which bring about responses on the part of some person whether the individual himself or some other person. We may consider these word-acts as stimuli, irrespective of whether the person intends them to be such, and so we might indicate here that we have two classes of definite language function, named, respectively, expressive and trans-missive stimulus word-acts. We may also observe that these words may operate as definite symbols in the same sense as the printed word. Probably in most cases in which the non-transmissive stimulus word-act operates, the total segment of behavior will not be language. That is to say,

the word voluntarily performed by the person may still not serve to elicit a definite language response on the part of some other individual.

(b) *Words as Responses*.—Here we think of the phases of the word in its functional operation as a response to some sort of stimulus, whether language or not. Now these words may be definite overt responses as in the case of answering questions, or they may be sub-vocal or other forms of verbal meaning and understanding responses. They may operate as final acts or as precurrent responses to some other final response.

In summarizing this analysis of words as language data and the differentiation of them from various kinds of non-psychological data, notice that we may speak of what from the every-day standpoint is considered the same word, but this same word is both physical and psychological, and may be at the same time both a stimulus and a response.

VIII. Summary.—(1) For objective psychology the problem of language is to place the prominent and pervasive linguistic reactions in their proper perspective with relation to the other coordinating functioning responses to stimuli and to avoid looking upon language as outer manifestations of mental states or the mere mechanics of speech.

(2) As a preliminary approach to the analysis of language we have distinguished between anthropological data (language as cultural products or entities; the philological data (language as fixed conventional modes of phonetic systems and their symbolic representation) and the psychological data (language as adjustmental behavior, that is, definite responses to stimuli). To a considerable extent the materials of the anthropologist and the philologist may be looked upon purely as stimuli when they are phases of psychological situations.

(3) A language act, being as definite a response as any other psychological act, must be somehow differentiated from other kinds of action. Our criterion is that language responses are inherently indirect or referential adaptations to stimuli, that is, they involve two stimuli, one the adjustment

stimulus, or the thing, person or situation acted upon or reacted to (for example a book to be picked up), the other an auxiliary stimulus or the person using language (giving a command, for example, for the book to be picked up). Two kinds of indirect action we may find, which we named respectively (1) mediative (language reactions connected with a direct reaction), and (2) referential (language reactions not connected with a direct response), the mediative type being related to direct action in three ways, namely, preceding, accompanying, or following, and the referential type either substituting for direct action or being purely conversational.

(4) Because of the close relationship and apparent similarity between thought and language (a similarity which leads psychologists to identify the two), we compared these two types of behavior, pointing out that they constitute (a) different types of adaptive responses on the part of the person and (b) that the two operate very differently.

(a) Thinking acts are either (1) planning, problem-solving, etc., definite adaptations to problematic or difficult situations or (2) simple implicit responses, that is to say, responses to absent adjustment stimuli aroused by a substitute stimulus. When thinking acts fall under (1) they are clearly different from conversation or language communication. So far as (2) is concerned, all types and modes of behavior may be implicitly performed including thinking (problem-solving), and consequently thought is no more identical with speech than with drinking or smoking.

With respect to (b), whereas language is always indirect adaptation, thinking is always direct.

Other facts militating against the identification of language and thought are (a) we can think and speak, or otherwise linguistically react, simultaneously to the same stimuli without any interference whatever. Also we can react to two entirely different stimuli at the same time when frequently it is possible to assume that either would require the use of the whole set of the same response factors that would have to be used in the other action, and (b) language

responses are different from thinking reactions (as implicit action at least) because they are more conventional.

To all of this discussion it should be added that from a morphological standpoint at different times thought and language may involve of course the same structural elements.

(5) Language reactions may be divided into various modes, (1) morphological (not serving true language function) and (2) functional (acting as a definite language response); the latter divided into (a) expressive (not involving any adjustive relationship to another person), and (b) communicative (involving adjustment to some other person). Communicative reactions are divided into (1) transmissive (language reactions serving as language stimuli) and (2) receptive (language reactions serving as responses only). Much of the expressive action may be communicative also, provided it serves as a language stimulus for some other person.

(6) Language reaction systems can be classified on the basis of a communicative form of language into the following types: I. Primarily transmissive, (a) vocal speech, (b) vocal gesture, (c) sub-vocal speech, (d) non-vocal gesture, (e) making signs and symbols; II. primarily receptive language reactions or understanding responses, (a) reading and comprehension, and (b) tactual receptive language reactions.

(7) Finally to differentiate between the various characters of language phenomena we analyzed words as follows: I. non-psychological words—(a) as purely physical or natural objects, (b) as morphologically language but not functionally so, (c) as human institutions (language custom); II. psychological data-words, (a) words as stimuli, and (b) words as responses.