

## İnsan Bildirimiyle İlgili Üç Teorinin Tahlil ve Tenkidi

### A REVIEW OF CURRENT THEORIES CONCERNING HUMAN COMMUNICATION

D. CÜCELOĞLU

Department of Psychology, Hacettepe University

*Bu yazı Tecrübi Psikoloji Çalışmaları, Cilt 8 de çıkan makalenin bir devamıdır. Önceki makalede I. Malumat Teorisi, II. Linguistik Teori ele alınarak bir bildirim modeli çerçevesi dahilinde incelenmişti. Şimdiki yazıda III. Davranışçı Teorinin bilhassa tek-basamaklı davranışçı modeli ile üç-basamaklı mutavassıtlı teori neveleri üzerinde durulmakta ve bunlar aynı bildirim modeli çerçevesi içinde mahiyetleri, insan bildirimiminin anlaşılmasına yaptıkları katkılar, ve bazı münaakaalı meseleler açısından ele alınmaktadır.*

*This is the second part of an article published in Istanbul Studies in Experimental Psychology, Vol., 8. In the previous article Information Theory (I) and Linguistics Theory (II) have been discussed in terms of a human communication model based on Osgood's integration-mediation learning approach. In this article the single-stage model and the three-stage mediational model of the Behavior Theory (III) have been discussed within the same communication model framework from different points of view; their nature, their contribution to the understanding of human communication, and some critical issues involved in these models.*

### III. Behavior Theory

#### III-i. The Nature of the Theory

Behavioristic theory is represented by different theories in the area of learning and only two of them — «single-stage» learning theory, and «three-stage» mediational learning theory — will be discussed here in relation with human verbal behavior.

### Single-stage learning theory

The essence of single-stage theory is that learning processes can be explained in terms of stimulus, response, and reinforcement as defined and demonstrated in Skinner's studies in animal psychology. Skinner (1938) defines a stimulus as a part of the environment and a part of behavior which elicits a lawfully related response. This lawful relation shows itself in smooth and reproducible curves. The term stimulus-controlled behavior signifies this dynamic relation between S and R. Reinforcement represents a kind of operation which causes change of strength in the S-R relation.

The use of this model in explaining both human learning processes and verbal communication processes (Skinner, 1957) raised some objections among psychologists and linguists. Osgood (1957) claimed that this model fails to account for symbolic processes, perceptual organization, and motor skills which underlie complex human behavior. Chomsky (in Fodor and Katz, 1964, p. 574) argued that such a model is based on observations and principles at animal level and hence cannot be employed in explaining verbal behavior for it is not built powerful enough to handle complex human behavior. At this point the relation of animal studies to human behavior deserve some consideration.

There is no doubt that experiments in animal psychology might clarify some basic principles which may very well be valid in human psychology, and as far as the clarification of these principles are concerned animal psychologists are justified in their motivation for investigating animal behavior (Hebb and Thompson, 1954). One should be rather careful, however, in attempting to interpret the behavior of higher organisms with the principles found in the investigation of lower organisms. It seems that in doing so there exists the danger of making a mistake in one of two possible directions: (1) anthropomorphism, which is the interpretation of animal behavior in terms of the principles underlying only complex human behavior, and (2) «animilization» which can be defined as the interpretation of complex human behavior in terms of the principles found only in animal studies.

It is rather difficult to deny the fact that we human beings have much in common with animals yet these common things are not the elements which define human beings as a distinct class of organisms. Darwin's evolution theory should have been the basic indication of the relative complexity of human organism, yet it seems that the same theory was interpreted by some

psychologists to mean that human beings are not different than animals. This attitude leads to extrapolation of the results found in animal psychology to human behavior. A single-celled animal shares some common principles of living with human beings, for instance, oxygen exchange with the environment, but this principle does not really tell much about the structure of the complex oxygen exchange system of higher animals, and without knowing this complicated system we, in fact, fall short behind in explaining the adaptation processes of these organisms. To be able to build a scientific theory to the satisfaction of his contemporaries a student of behavior should take into account the set of characteristics of the living organism by means of which the organism occupies a given position on the evolution scale<sup>1</sup>.

According to Skinner «the individual organism simply reacts to its environment, rather than to some inner experience of that environment» (Skinner, 1961, p. 114)». This is the well known «empty-organism» point of view. When a student of behavior looks at the organism from this standpoint he is destined to ignore the complex inner mechanisms by means of which the organism is defined distinctively in relation to other organisms. It has been argued that when he attempts to interpret complicated human behavior, Skinner does not follow strictly his main strategy. He puts constructions into the organism which are not well-defined and uses these not well-defined constructions in crucial points while he is explaining human behavior (Jakobovitz, 1966).

### Three-stage mediational learning theory

The mediational theory of learning as represented by Osgood makes extensive use of the inner structure of the organism. The first stage of the model is called the **projection level**. There are two principles operating at this level: **isomorphism**, and **unmodifiability**. Isomorphism indicates the fact that a given physical stimulus **S** has an effect on a well-defined location as **ś**. The relation between **S** and **ś** is unmodifiable, thus learning and past experien-

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1. Hebb, we believe, is expressing a similar idea in following words: «Clearly the biosocial communication of wasp or termite, sense-dominated and reflexive, differs in mechanism from the purposive (psychological) communication of ape or man. This leaves us still with the problem of accounting for that «something else» that produces systematic deviation from the S-R formula in some of the behavior of the higher animals... (Hebb, (1964))».

ces do not change the location of  $\delta$ . The second level, called the **integration level**, is an addition to the two-stage model previously suggested by Osgood (1953). The basic motivation for adding this level to the previous two-stage model comes from the insufficiency of the previous model in explaining such perceptual phenomena as grouping, closure, and motor skills. The characteristic of this level is to mirror the past experiences of the individual. There are three basic principles working at this level: **frequency**, **redundancy**, and **temporal contiguity**. «If the frequency of input or output pairing is high, the occurrence of one central event may become a sufficient condition for the central occurrence of the other with which it has been redundant, in which case we would have what I call an **evocative integration** (Osgood, 1966)». If the frequency of pairing is low, the time interval between the redundant events is relatively great, then the occurrence of one central event will serve to predict the others, and this is called a **predictive integration**. The third level is called «**representational-mediational Level**». Since the characteristics as well as the principles operating at this level are explained in detail elsewhere (Osgood, 1953) we needn't elaborate the characteristics of this level here.

### III-ii. The Contributions of Mediation Theory to the Understanding of Human Communication

The communication model presented previously while discussing Information Theory and Linguistic Theory is based on Osgood's integration-mediation model. The projection level corresponds to (R), and (T) in our model and they contain the «isomorphic» and «unmodifiability» principles. The integration level corresponds to the (Igr) component and is governed by the principles of frequency, redundancy, and temporal contiguity. Component (I) contains representational processes.

Previously it has been pointed out that intention plays a central role in the definition of a sentence. (I) is assumed to be the source of intention. (Igr) contains rules about formal structures of linguistic behavior and this structured energy is transmitted by (T) to (MR) in an acceptable form of energy and (MR) converts the structured neurological energy into structured physical sound waves. These are called **encoding** processes. These sound waves travel through the air (i.e., the channel) and are received by the destination. They are converted into neurological impulses by component

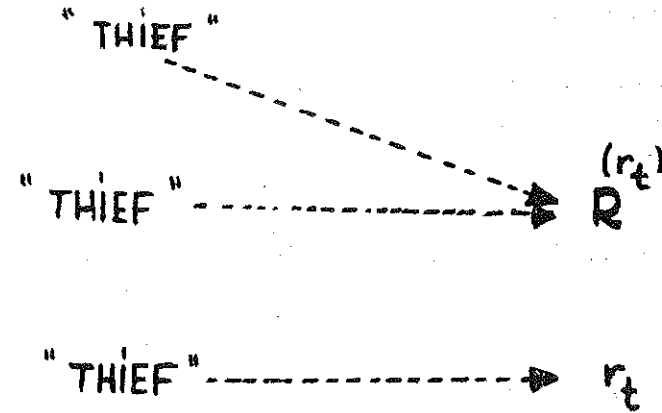
(SR). Component (R) connects these to component (Igr), which operates under the same rules that govern encoding processes. Finally, it is component (I) which converts the input signals into a meaningful message.

In section II-ii it was suggested that transformational grammar employs rules and structures which are represented in (Igr) and (I) components. This does not mean that linguists and psycholinguists are claiming two different things in the same part of the organism. It seems that both the linguists and the psychologists are dealing with the same phenomena at different levels of involvement. Psycholinguistic theory is more inclusive than linguistic theory. It includes the relation of component (I) to various sorts of messages (verbal and non-verbal), and different kinds of feedback systems. Linguistic theory confines itself into a particular kind of message and tries to find out the formal relations between its components. It does not concern itself either with feedback systems or with proper language use in a given social context.

In attempting to differentiate the goals of linguistic and psycholinguistic theories Osgood says that «Focusing on the message **Per se**, most linguists have not been particularly concerned with the meaningful relation of linguistic events to non-linguistic events (semantics) nor with the adjustive relations that language makes possible (pragmatics); psycholinguistic theory must include both an accounting of the meaning of signs and an accounting of how language mediates adaptive behavior (Osgood, 1966 a, p. 23)». Psycholinguists found themselves more interested in language performance than in language competence. This emphasis on performance led some psychologists to underestimate the role of grammar in language behavior. Mowrer can be taken as an example in this regard. He says that «the sentence is preeminently a conditioning device, and that its chief effect is to produce new associations, new learning, just as any other paired presentation of stimuli may do (Mowrer, 1954)».

When someone, say John, introduces Tom to William «... as a result of the paired presentation or occurrence of «Tom» the word and **Tom** the person, the component, or the detachable reaction,  $r_t$  gets shifted from the latter to the former.» «And similarly for the word «thief». As indicated in below this word is likewise presumed to have acquired its distinctive meaning by having been used in the presence of, or to have been, as we say, «associated with» actual thieves. Therefore, when we make the sentence «Tom (is a) thief» it is no way surprising or incomprehensible that the  $r_t$

reaction gets shifted from the word «thief» to the word «Tom» (Mowrer, 1954, p. 667)».

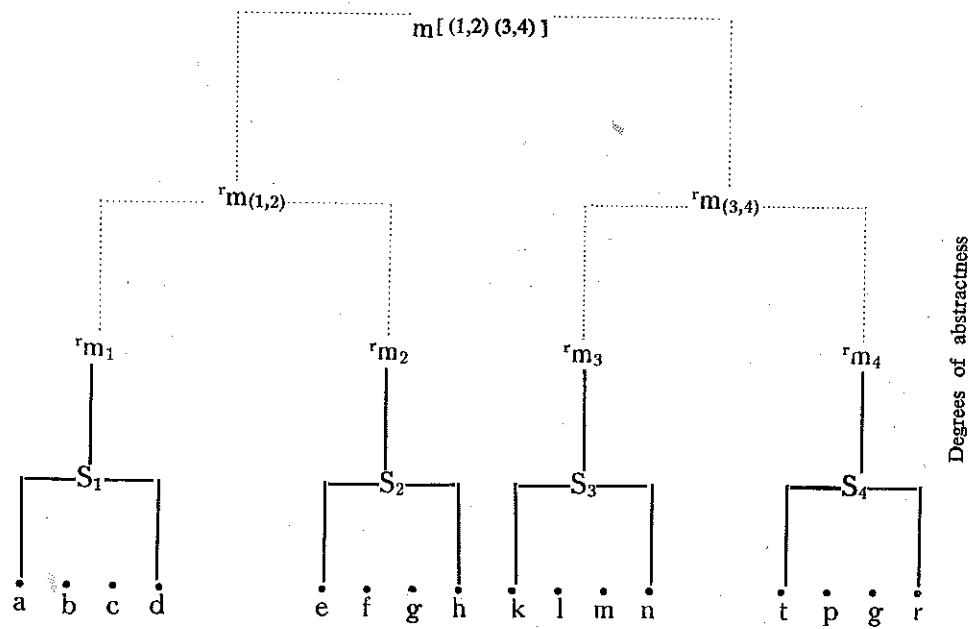


Mowrer seems to be disregarding certain problems which may arise from structural properties of sentences. «Tom is a thief» is a sentence in which Tom as the subject of the sentence acquires a certain new meaning through the connection of the predicate «thief». One might ask why necessarily Tom, but not the article *a* acquires the meaning of «thief». Let us assume that John has uttered the following sentence in the presence of William: **Tom, whom you saw yesterday with his uncle Bruce Spencer, is a thief.** And then ask a native speaker of English whether Tom or Mr. Spencer is the thief? The answer undoubtedly will be «Tom». However, Tom is distant both in time and space from «thief», compared to Bruce Spencer. The conditioning model, which assumes the proximity of the two stimuli in time and space as one of the basic determinants, fails to account for the grammatical structure of the sentence.

In the following paragraphs an attempt will be made to indicate that rule governed language behavior can be accounted for within the integration-mediation model. This attempt admittedly lacks some necessary details in showing the connections between the phenomenal world and the hypothetical model. However, it provides us with a new direction in explaining rule-governed behavior of human beings.

Assuming that not only the objects but the relations between them can function as stimuli, it can be proposed within the integration mediation fra-

mework that any relation  $S$  among a group of elements can be represented as  $r_{m1} \dots s_{m1}$  within the nervous system, and this representation may integrate with another representation  $r_{m2} \dots s_{m2}$  signifying  $S_2$ . If four groups of elements  $( G_1 = \{ a, b, c, d \}; G_2 = \{ e, f, g, h \}; G_3 = \{ k, l, m, n \}; \text{ and } G_4 = \{ t, p, q, r \} )$  are provided with a certain relation  $S_1, S_2, S_3,$  and  $S_4,$  among its members; the model under study can take  $S_1$  and  $S_2$  as central correlates in the (Igr) component and find the relation between them and store it in component (I) as  $r_{m(1,2)}$ . The model has the capacity of producing a highly abstract representation  $r_{m(1,2)(3,4)}$  of the significant relation between the two representations  $r_{m(1,2)}$  and  $r_{m(3,4)}$ . Assuming complex



feedback mechanisms which interact between each level reciprocal effects are established and a control device is provided.

Syntactic rules mainly define conditions for the location of linguistic elements within the verbal structure. It seems reasonable, therefore, to put syntactic rules in component (Igr) whereas semantic rules go into compo-

ment (I). It seems legitimate to propose that feedback mechanisms underlie the problem of awareness. Assuming that all representational processes require a certain degree of awareness —one has to know what he is thinking or talking about— we can propose that those processes which take place at the integration level can acquire awareness only through feedback mechanisms taking place between components (Igr) and (I). It can also be hypothesized that there are Markovian-type processes at the integration level. It seems legitimate to think that certain motivational and situational factors constantly determine the nature of rules which operate on a probability basis, i.e., optional rules. The existence of optional rules indicates that the nature of intention in component (I) interacts with syntactic rules in component (Igr) through feedback mechanisms which operate not only in **encoding** processes —as in talking— but also in decoding processes — as in listening.

### III-iii. Some Crucial Issues in Integration-Mediation Model

Mediation theory has been criticised by some linguists on the following two grounds: (1) the mediation model offers no explanation for the difference between names and predicates; (2) it can be reduced to the single-stage model and hence it can be subject to all the arguments made against the single stage model (Fodor, 1965). Concerning the first argument it is pointed out that in a sentence such as «Tom is a thief» we ask

.What does **thief** mean?

but not

.What does **Tom** mean?

A theory which can not explain the underlying reason for this fact is claimed to be less than satisfactory as a theory of meaning and language. Osgood agrees that this is a valid criticism, for the mediation model does not make the fine distinctions in denotative meaning underlying the difference between names and predicates. He says that «The nature and measurement of denotative meaning is a gaping hole in our account, and all I can say that is that we are working on it (Osgood, 1966 a, p. 33)».

The argument that the mediational model can be reduced to the single-stage model is expressed as in the following: «The relation of **r**'s to **R**'s (i.e., mediational response's to observable response's)<sup>2</sup> must be one to one if

2. The statement within the parantheses is mine.



mediation theories are to provide a coherent analysis of reference of univocal signs ... So long as each  $r_i$  belongs to one and only one  $R_i$ , the **only** distinction that can be made between mediation and single-stage views is that, according to the former but not the latter, some of the members of stimulus-response chains invoked in explanations of verbal behavior are supposed to be unobserved. But clearly this property is irrelevant to the explanatory power of the theories concerned (Fodor, 1965, p. 80)». Here Fodor is referring to two-stage mediation theory rather than three-stage mediational model. The Integration level has been added to the two-stage model to give an account of evocative and predictive integration observed in some perceptual phenomena. Assuming the existence of evocative and predictive relations amongs  $r_i$ s we can be led to the possibility that a given  $S_i$  may not necessarily produce a definite  $R_i$ . It may evoke or predict a  $R_j$  which previously has not been coupled with  $S_i$ . Hence Fodor's claim that the mediational model can be reduced to the single-stage model does not hold true for the three-stage mediational model. Osgood claims that Fodor's criticism is not valid either for the two-stage mediational model. He says that «there are significant differences between single- and two-stage theories... The most important of these is the functional independence of decoding and encoding processes in a two-stage theory (Osgood, 1966 c)».

In conclusion it should be pointed out here that the discussion concerning the functional equivalence of the mediation model to the single-stage model is based upon on formal-logical grounds rather than empirical ones. It seems that neither side of the argument provided sufficient evidence to lead to a definite conclusion on the controversial issue. Even though they do not lead to a definite conclusion, it is hoped that the disagreements between the linguists and the psychologists will eventually lead to critical empirical testings in the field of psycholinguistics.

## BIBLIOGRAPHY

- Fodor, J. A. (1965). Could meaning be an  $r_m$ ? **J. Verb. Learn. Verb. Behavior**, 4, 2.
- Fodor, J. A. and Katz, J. J. (1964). **The structure of language, readings in the philosophy of language**, Prentice Hall Inc., Englewood Cliffs, New Jersey.
- Hebb, D. O. and Thompson, W. R. (1954). The social significance of animal studies, in G. Lindzey's (ed) **Handbook of social psychology** Addison-Wesley Publishing company, Inc. Cambridge 42.
- Hebb, D. O. (1964). The American revolution, in **The cognitive process** edited by Harper, R. J. S., Anderson, C. C., Christensen, C. M. and Hunka, S. M. Prentice Hall, Inc., Englewood Cliffs, N. J.
- Jakobovits, L. A. (1966). Mediation theory and the «single-stage» S-R model; different? (Mimeo).
- Mowrer, H. (1954). The psychologist looks at language, **Amer. Psychologist** 9, 660-694.
- Osgood, C. E. (1953). **Method and theory in experimental psychology**, Oxford University Press, New York.
- Osgood, C. E. (1957). Motivational dynamics of language behavior, in **Nebraska Symposium on Motivation**, edited by M. R. Jones, University of Nebraska Press, Lincoln, Nebraska.
- Osgood, C. E. (1966 a). On understanding and creating sentences, Institute of Communications Research publication, (Mimeo).
- Osgood, C. E. (1966 b). From models of L to models of U, (Mimeo).
- Osgood, C. E. (1966 c). Meaning cannot be  $r$ . **Journal of Verbal Learning and Verbal Behavior**, 5, 402-407.
- Skinner, B. F. (1938). **Behavior of organism**, Appleton-Century Crofts, Inc., New York.
- Skinner, B. F. (1957). **Verbal Behavior**, Appleton-Century Crafts, Inc., New York.
- Skinner, B. F. (1961). Critique of psychoanalytic concepts and theories, in **The Validation of Scientific Theories** edited by P. G. Frank. Collier Books, New York.