The Developmental Approach to Cognition: Its Relevance to the Psychological Interpretation of Anthropological and Ethnolinguistic Data

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IT IS the purpose of this paper to elucidate the comparative developmental approach in psychology and to illustrate its application to problems of concern to anthropologists, ethnolinguists, and psychologists alike. To this end, we shall (A) discuss the nature of the developmental approach to cognition; (B) meet critically some of the objections to the application of the developmental concept of "primitivity" to anthropological-linguistic data; and (C) demonstrate the value of the developmental approach in relating ethnolinguistic data to psychological experimentation.

(A) THE NATURE OF THE DEVELOPMENTAL APPROACH TO COGNITION

A general developmental approach has been of heuristic value in systematizing certain aspects of biological phenomena in various fields of life science such as comparative anatomy, embryology, neurology. It is the aim of developmental psychology to view the total behavior of all organisms in terms of similar developmental principles. It is our belief that such an approach is fruitful in coordinating, within a single descriptive framework, psychological phenomena observed in phylogenesis, ontogenesis, psychopathology, ethnopsychology, etc., and in linking these observations to the formulation and systematic examination of experimentally testable hypotheses.

It is most important to distinguish two facets of the developmental approach: as a framework for formulating hypotheses and as a set of empirical generalizations which are couched in terms of this developmental framework. Thus, on one hand, developmental psychology is a mode of viewing the behavioral manifold; on the other hand, it presents for empirical and experimental testing, assumed developmental relationships within that manifold.

The developmental psychology of cognition postulates one regulative principle of development, the following orthogenetic principle: wherever development occurs, it proceeds from a state of relative lack of differentiation to a state of increasing differentiation, articulation, and hierarchic integration. This principle has the status of an heuristic "law" (Toulmin 1953). Though itself not subject to empirical test, it is valuable to developmental psychologists in directing inquiry and in determining the actual range of applicability with regard to the behavior of organisms.

We may offer several illustrations of how this principle is applied in the interpretation and ordering of psychocultural phenomena.

1. According to this principle, a state involving a relative lack of differentiation between subject and object is developmentally prior to one in which there is a polarity of subject and object. Thus the child's acceptance of his

dreams as external to himself, the relative lack of differentiation between dreams and actuality, as is found in psychosis and in some nonliterate societies, the breakdown of boundaries of the self in mescaline intoxication and in states of depersonalization,—all of these betoken a condition of developmental "primitivity" compared to the polarity between subject and object found in reflective thinking.

2. An experienced product which is due to a lack of separation and hierarchization of functions is developmentally earlier than one which involves a separation and hierarchization of these functions. Thus, eidetic imagery, dreams, hallucinations, synaesthetic perceptions, may all be regarded as functionally more undifferentiated and thus more primordial phenomena than the products of relatively isolated functions.

3. Modes of expression which indicate a relative lack of differentiation between an abstract, nontemporal, general concept and a time-bound, tangible concrete context are genetically prior to modes of expression which evidence abstracted concepts of number, space, time, etc., relatively independent of any specific contexts. Concepts within our own culture, like "ream" (applied to paper), involve an earlier form of conceptualization than number concepts such as 500 whatever-they-might-be.

4. Conceptual classifications which are formulated in terms of adherence to particular concrete objects employ a genetically earlier mode of cognition than classifications of properties abstracted from specific objects. A color classification which employs color terms such as "gall-like" for a combination of green and blue, or "young leaves" for a combination of yellow and green (Boas 1910:377) is genetically prior to a conceptual color system independent of objects such as gall or young leaves.

With regard to this last example, we might illustrate the comparative character of the developmental approach. That color classification attached to specific objects involves a mode of cognition genetically prior to one independent of specific objects is consistent with the main theoretical principle of development. In regard to the comparative character of our discipline, however, it does not suffice for us merely to find this type of classification more frequently in certain (let us assume) typical nonliterate "collective representations" than in Western "collective representations." The anthropological data point up the necessity for determining whether there is a greater prevalence of such primitive color conceptualization among groups whose relatively low developmental status is generally acknowledged, such as in young children and certain psychopathological individuals. In many brain-injured individuals, for example, we find a concretization of color conceptualization, symptomatic of their psychopathology (Goldstein 1948; Head 1926). Experimental studies on schizophrenics as well as young children have also demonstrated the greater prevalence of concrete (context-bound) conceptualization with regard to color and to many other phenomena as well (Baker 1953; Werner 1948; Werner and Kaplan 1950).

We hope to have emphasized that developmental psychology is essentially

a comparative discipline. Therefore, in considering, from a developmental point of view, the systematic significance of data from any of the pertinent fields such as anthropology, we must consider them not in themselves alone but in the light of evidence from other areas such as child psychology and psychopathology; eventually, developmental statements must be evaluated in terms of the findings of experimentation.

(B) CRITICAL EVALUATION OF OBJECTIONS TO A CENTRAL CONCEPT OF MODERN DEVELOPMENTAL PSYCHOLOGY

Many of the objections which have been raised to developmental analysis of social and behavioral phenomena rest, it seems to us, on certain basic conceptual and terminological confusions inherited from controversies of the late nineteenth and early twentieth centuries. Most of the polemic has centered around the concept of "primitivity." We will discuss and evaluate five closely interwoven confusions with reference to this concept (cf. Arieti 1956): (1) confusion between primitivity as an evaluative and as a designative concept; (2) confusion between primitivity as defined temporally and as defined logically; (3) confusion between primitivity as an ideal construct and as a predicate applied to cognitive activities of actual men; (4) confusion between the phenomena of primitivity and the conditions of the phenomena; and (5) confusion between primitivity as characteristic only of certain types of mind and as an ever-present feature of the mental functioning of all individuals.

(1) The first confusion, that between an evaluative and a designative use of the concept of primitivity, will be discussed only briefly. In general, the users of this concept have been regarded by some anthropologists as employing it in a moralistic and normative manner; as saying that primitivity is bad. We imply no such judgment toward what we term "primitivity" of cognition. Instrumentally, primitivity may function now to prevent the organism from achieving certain ends, or again to enable the organism to achieve other ends (see below, p. 871).

(2) The second confusion, that between the temporal criterion and the logical criterion of primitivity, is still widely prevalent. For some imbued with the idea of a cosmic unilineal process toward increasing progress, "primitive" has meant that which comes chronologically first. From the viewpoint of developmental psychology, the developmental progression is defined not by chronological sequence, but by the principle of increasing differentiation and hierarchic integration. It is empirically true that the processes emerging in the actual time sequence frequently conform to the developmental sequence; what occurs earlier in time often involves a greater lack of differentiation than what occurs later. This empirical relationship, however, does not entail the proposition that temporal order of emergence and developmental sequence are of the same logical character.

(3) The third confusion, that between ideal and actual primitivity, is closely related to the confusion between developmental and temporal primitivity. Some students have not recognized that the predicate "primitive"

may have two distinct usages: it may indicate the typical mode of functioning of any actual individual; or it may refer to an ideal construct, an ideal mentality characterized entirely by primitive processes.

Developmental psychologists view the concept of primitivity chiefly as such a theoretical construct. Primitivity is defined in terms of the general developmental principle; within the confines of the developmental framework it is not susceptible to proof or disproof. Empirical investigations are relevant insofar as one seeks to determine whether certain psychological states or operations, which the psychologist categorizes as relatively primitive, occur in the actual groups and individuals the social scientist studies. Thus, from the viewpoint of developmental psychology, magical belief is a primitive state, regardless of the conditions which provoke it; it is, by its very nature, characterized by a relative lack of subject-object differentiation compared to scientific thinking. The anthropologist *qua* anthropologist may not be concerned with whether the belief is primitive or not. He may limit his task to determining whether the members of society X have magical beliefs or not, how permeable these beliefs are to experience, etc. The developmental psychologist may nevertheless utilize anthropological data as illustrative or corroborating material for developmental formulations.

(4) The fourth confusion, that between the nature and conditions of primitivity, is again closely related to the other confusions. Contemporary developmental psychologists are naturally interested in the conditions under which primitive forms of cognition are manifested. This concern with conditions, however, presupposes an adequate description and classification of phenomena as such.

As we stated in the beginning, there are two facets to the developmental approach: it is both a framework for describing processes and a framework for formulating empirically testable hypotheses. It is only with regard to the second facet of the developmental approach that the problem of conditions is relevant. Thus, within general developmental formulations, one accepts magical behavior (assumed to reflect a lack of sharp separation of subject and object) as more primitive than rational, scientific behavior. With regard to specific developmental hypotheses, one may formulate testable empirical propositions such as "Individuals under anxiety manifest more magical practices than nonanxious individuals," "Schizophrenics manifest more magical practices than normals," "Individuals in preliterate societies have more magical practices than individuals in advanced technologies," etc. The determination of whether or not one is willing to accept these hypotheses as confirmed rests on empirical study.

Since this confusion between the nature and conditions of primitivity underlies to a considerable extent the rift between developmental psychologists and some anthropologists, it may be worthwhile to elaborate this discussion with concrete references to anthropological material.

From the viewpoint of the general developmental principle and its implications, a relative lack of differentiation of self and not-self characterizes more

primitive developmental stages. Empirically, such a lack of differentiation has been observed to occur more typically in organisms admittedly at a lower stage of development, such as children and psychotics.

With regard to the condition of precivilized society, preliterate society, or technologically backward society, one may advance the empirically testable hypothesis that the mentality of individuals under such conditions will also be characterized by a greater lack of differentiation between self and not-self (compared to 'civilized' man). In this respect, the recent work by Robert Redfield is of direct relevance.

In "The Primitive World and Its Transformations," Redfield insists on the lack of differentiation between self and not-self as a prevalent feature of preliterate groups. Thus, he finds as typical in preliterate societies: (a) a lack of distinction among personal, natural, and sacred qualities in viewing the world, (b) a relation of mutuality rather than exploitation between man and his environment, (c) a moralization of nature, that is, a lack of differentiation between physical and psychological causation, and also a view that things happen because an immanent Thou decrees them.

To quote Redfield (1953:108): "In modern times, especially in the west where science has been so influential, we may recognize one of the great transformations of the human mind. It is that transformation by which the primitive world view has been overturned. The three characteristics of that view . . . have weakened or disappeared. Man comes out from the unity of the universe within which he is oriented, now as something separate from nature and comes to confront nature as something with physical qualities only, upon which he may work his will. As this happens, the universe loses its moral character and becomes to him indifferent, a system uncaring of man."

Thus, if one takes Redfield's evidence as conclusive, one may accept the validity of the proposition that actual primitive man is developmentally characterized by a greater psychological primitivity than actual civilized man.

(5) This discussion brings us to the fifth confusion, that between primitivity as a predominant characteristic of certain types of mind, and primitivity as an ever-present feature of all minds.

Anthropologists and sociologists have frequently attacked evolutionary psychology because it seemed to imply that Western man was completely different from primitive man. This objection is undoubtedly justified if we are on the plane of actual comparisons of individuals. In this sense, the argument attributed to Levy-Bruhl of two actual types of mentality, one primitive and one nonprimitive, was legitimately rejected (Arieti 1956).

This objection was frequently bolstered by references to empirical evidence of the manifestations of primitivity in individuals reared in the Western cultural tradition (Boas 1927:2). To the developmental psychologist, to show primitivity in groups or individuals in technologically more advanced cultures is not an argument against developmental levels of cognition, but rather a demonstration that the conditions for primitivity are not limited solely to membership in technologically undeveloped societies.

Anthropologists and sociologists have in this way contributed to a knowledge of the different conditions which coexist with higher and lower forms of thought. However, their work in no way refutes the proposition of a diversity of cognitive forms nor of a hierarchy of such cognitive forms.

Because of the significance of the issue for theory and experiment, we should like to make two further points concerning the presence of primitive processes in all men, preliterate and civilized.

First, in regard to the presence of primitive activities in Western man as well as in nonliterate man, we would venture a hypothesis that Redfield's analysis tends to support: that members of preliterate societies operate more homogeneously on a primitive level, whereas the mentality of members of Western societies is more likely to be stratified, and to show a wider range of forms of thought. The same individual in Western culture may function, now with the advanced categories and operations of the scientist, now with the more undifferentiated operations of the devout believer, whereas preliterate man is much more likely to operate homogeneously on a relatively primitive level (Redfield 1953:13).

Our second point deals not only with the existence but with the instrumental necessity of primitive processes for certain highly valued activities of Western man. Contrary to frequently held presuppositions, developmental psychologists do not assert that developmentally later forms root out and obliterate more primitive forms of activity. In fact, we believe that more advanced states in a developmental sequence require for their emergence the primitive background out of which they differentiate, and from which they never completely become divorced. Moreover, the developmental psychologist recognizes that one must be able to return to less differentiated modes of action and thought if one is to be able to break the bounds of a fixed way of looking at things, i.e., to be creative in art or science (Kris 1939; Ghiselin 1955), or to attain adequate interpersonal relationships, or to enjoy art, poetry, humor, or to view the world in any way afresh. In this sense, "the child is perpetually the father of the man."

(C) THE DEVELOPMENTAL APPROACH TO A GENERAL PSYCHOLOGY OF LANGUAGE AND THOUGHT AND ITS RELATION TO ETHNOLINGUISTIC DATA

We have thus far attempted to elucidate the developmental approach in general. In this section, we should like to illustrate concretely the relevance of the developmental approach to a pivotal problem for a comprehensive science of man, namely, the relation of linguistic codification to the development of one's conception of the world. We hope here to demonstrate how developmental psychologists bring actual experimentation to bear on a problem of this sort.

A number of scholars, interested in problems of ethnolinguistics, have recently rejected the viewpoint that language consists of labels which one learns to attach to a fully articulated, prelinguistically formed reality. Students such

as Edward Sapir, B. L. Whorf and D. D. Lee have revived Wilhelm von Humboldt's thesis that language is intimately involved in the organization of our conceptions of reality, and has a compelling power over the way in which we see and think about our universe (cf. Hoijer 1954). This neo-Humboldtian view has resulted in two types of studies: one, taking the relation between inner linguistic form and experience as an hypothesis, has sought to determine empirically how the linguistic code of a society relates to its world view; the other, taking the relation between linguistic form and experience of reality as an axiom has sought to infer the experience of individuals from the nature of their verbal code.

The contemporary Humboldtians have typically concerned themselves with showing the varieties of language patterns in relation to world views. They have presented differences among languages and cultures without raising the question of whether these differences are orderable within a developmental sequence.

The developmental psychologists have no quarrel with the view that different linguistic structures are intimately linked with different cognitions. We do, however, seek to go beyond the Sapir-Whorf-Lee thesis as it is usually presented.

(a) We regard linguistic products as one manifestation of a general symbolizing function which we assume to underlie them. In this sense, we are perhaps closer to Humboldt than the modern Humboldtian linguists. Language, for us, is primarily activity and only secondarily product.

(b) We question the identification of all of experience with a single mode of expression—and in fact the most advanced mode of expression—verbal language. It is our thesis that experience is organized simultaneously at various psychogenetic levels and that the linguistic code of any society is only one level at which experience is expressed.

(c) We assume that certain patterns of verbal-linguistic organization are, in terms of their formal psycholinguistic characteristics, closer to preverbal modes of articulating experience (gestural syntax, dream structure, etc.) than other linguistic patterns. In other words, we do not regard all psycholinguistic phenomena as being on the same level of development.

Accepting the developmental-comparative framework, it may be reasonably asked: "What is the fundamental criterion for contrasting more primitive linguistic structures with more advanced linguistic patterns?" No developmental psychologist could have stated the general law of language development more succinctly than Jesperson (1950). In discussing actual evolutionary sequence, he states: "The evolution of language shows a progressive tendency from inseparable irregular conglomerations to freely and regularly combinable short elements." Jespersen continues, "The direction of movement is towards flexionless languages (such as Chinese, or to a certain extent modern English) with freely combinable elements; the starting point was flexional language (such as Latin or Greek); at a still earlier stage we must suppose a language

in which a verbal form might indicate not only six things like *cantavisset*, but still a larger number, in which verbs were perhaps modified according to the gender (or sex) of the subject, as they are in Semitic languages, or according to the object, as in some American Indian languages, or according to whether a man, a woman or a person who commands respect is spoken to as in Basque. But that amounts to the same thing as saying that the borderline between word and sentence was not so clearly defined as in more recent times; *cantavisset* is really nothing but a sentence-word . . . " (Jespersen 1950:425).

In this section of our paper, we shall present our theses chiefly in relation to D. D. Lee's analysis (1950) of the Trobriand Islanders. We feel that Mrs. Lee has provided illustrations of a general relationship of language to culture. Developmentally her work may be interpreted as showing that technologically backward and relatively static cultures are reflected in psycholinguistic patterns which are developmentally of a more primitive character.

With regard to the Trobriand language and thought, Dr. Lee remarks,

"A Trobriand word refers to a self-contained concept. What we consider an attribute or a predicate, is to the Trobriander an ingredient. Where I would say, for example, 'a good gardener' or the 'gardener is good,' the Trobriand word would include both 'gardner' and 'goodness'; if the gardner loses the goodness, he has lost a defining ingredient, he is something else and he is named by means of a completely different word. A *taytu* (a species of yam) contains a certain degree of ripeness, bigness, roundedness, etc.; without one of these defining ingredients, it is something else, perhaps a *bwanawa* or a *yowana*. There are no adjectives in the language; the rare words dealing with qualities are substantivized."

From this Mrs. Lee infers the nature of Trobriand experience as follows: "Events and objects are self-contained points . . . ; there is a series of beings but no becoming. There is no temporal connection between objects . . . . Neither is there a temporal connection made—or according to our own premises, perceived—between events; in fact, temporality is meaningless" (Lee 1950:91).

Mrs. Lee's analysis has stressed the difference of Trobriand language and thought from English language and thought. She has contrasted the lack of differentiation and the nonlineality in this language and culture with the stress on individuality and lineality in our own language and culture. She has not, it seems, been concerned with a developmental analysis of these differences. From our point of view, however, and in line with the thinking of such linguists as Jespersen (1950) and Meillet (1948), the Trobriand language shows a predominance of features which in comparison with English linguistic structure are characteristically more primitive.

For instance, when the Trobriander does not articulate an invariant concept of gardener or yam—a concept which retains a relative constancy despite varying qualifications—his expression is not only different from that of a speaker of English but is developmentally more primitive. The absence of adjectives in the Trobriand language, mentioned by Mrs. Lee, involves the

absence of the typical devices for qualifying articulated invariants; it implies, as Mrs. Lee herself intimates, a world view of changing tableaux, with no conceptual objectification of anything undergoing change. Experimental and clinical evidence from the study of children (Piaget 1954), both prior to their use of language and in the early stages of language usage, and also evidence from the investigations of schizophrenics (Arieti 1955; Baker 1953) premorbidly acculturated to advanced modes of cognition, clearly indicate that conceptualization in genetically undifferentiated or dedifferentiated individuals tends exactly toward this tableau character; one finds, typically, concepts which change their qualitative meaning with changing contexts. What would be for us relatively the same concept despite varying contexts, is for them a variety of different concepts (or objects) because of the lack of differentiation of concept (or object) from context. In other words, the lack of differentiation and the nonlineality found in the Trobrianders are characteristic of explicit child linguistic-thought within our society and, as we shall show, are also characteristic of the formal structure of more primitive modes of expression present in all members of Western European culture.

Until now we have dealt with the developmental frame of reference and its empirical application to material which is derived mainly from observational techniques in various social science disciplines. As we have suggested at the beginning of this section, an experimentally oriented developmental psychology must go further; it must attempt to formulate hypotheses which are susceptible to test in laboratory experimentation. Although much of its illustrative data is taken from sciences concerned with the concrete details of psychocultural phenomena, developmental psychology per se is also a general experimental discipline; it seeks to relate its empirical generalizations to experimentation formulated in terms of general developmental assumptions. We shall now seek to illustrate this aspect of the developmental approach.

If we accept the supposition that certain forms of psycholinguistic expression are more primitive than others, and also the assumption that Western man retains primitive modes of cognizing his transactions with the world, we may then search for an experimental technique which tends to evoke primitive forms of expression. We have attempted to develop methods suitable for bringing forward dispositionally present, earlier modes of symbolic structurization of experience in Western man—modes which we assume persist in his stratified mentality, but which are hidden by the structure of his verbal linguistic patterns. We should like to discuss and illustrate one of these methods —a method which we have called "the technique of line schematization" (Kaplan 1955).

Briefly, this technique involved the expression in line-drawings of the experience of meanings conveyed by words. Subjects are instructed as follows:

"We've often found that people can express the meaning of words or sentences without using other words. They might, for instance, use line drawings, colors or three-dimensional patterns—like wire patterns, etc. For example, here are two lines drawn by the

same person—one to represent the word 'sad,' the other to represent the word 'gay.' "Many people would go along with the person who drew these lines in taking the first drawing as representing 'sad' and the second as representing 'gay.' Of course, there

FIG. 1

are no right or wrong answers here; one can represent a word any way he wants. Now, I would like you to express, in as many lines as you wish, the following sentences" (phrases, words).

The subject is then presented with the experimental material, consisting of sentences, phrases, words, etc.

We may list briefly the advantages of this sort of technique for the experimental study of levels of symbolic structurization of meaning:

(1) It enables us to stabilize and fix a transitory experience, (2) it enables us to make our experience of linguistically conveyed meaning an external object to ourselves and others; (3) it enables us to transcend our own linguistic code; (4) it enables us to see synchronously what in terms of linguistic utterance is given in time; (5) it enables us to get at a level of symbolization closer to gesture and dream-like states.

In the context of what we have said above, we may now discuss two of the studies we have undertaken using this line-schematization technique and then relate our findings to our previous considerations.

The first experiment involves the schematization in lines of four sets of three sentences; each of the three sentences forming a set contains the identical pronoun and verb, but differs from the other two sentences by its grammatical object, e.g., "he catches a fly," "he catches a lion," "he catches a criminal," etc. One of four verbs was used in each set: opens, loves, catches, closes.

We have undertaken this particular study chiefly in order to examine the formal characteristics of experience of meaning as expressed in the line medium. It is our expectation that in this more primitive medium, the genetically earlier modes of cognition should become objectified. We would therefore hypothesize that the differentiation and autonomy of units which culminates in the relative independence of the verb from its grammatical object in the spoken language, would in the linear expressions be replaced by contextual contamination, i.e., the verb would be experienced within the line language as varying with the changing contexts.

It is quite clear from our results that on this level of expressing experience, the verb is not experienced as an isolated, freely combinable element; it has

not reached a level where it is abstracted from its object context. Let us illustrate this with the following schematizations from a typical subject.

In analogy now to Mrs. Lee's discussion of the Trobriand Islander's *taytu* which becomes a different thing with each change in what we would call an attribute, we find here that "catches" becomes a different activity with each change in object. With regard to the drawings, the "catches" of "he catches a fly" is expressed as a smooth, relatively fast, continuous activity; in "he

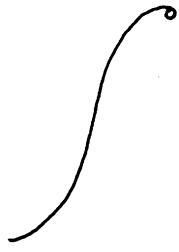

FIG. 2

He catches a fly

FIG. 3

He catches a lion

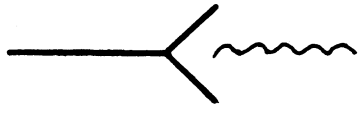

FIG. 4

He catches a criminal

catches a lion" it is expressed as a slow arduous activity; in "he catches a criminal" it is expressed as a harsh, direct, serious activity.

Strictly speaking, of course, there is no one-to-one correspondence between the linguistic elements and the line language: there is no element in the drawings which corresponds to "catches" in isolation. Thus, in the first case the total symbol expresses in a relatively undifferentiated way the "sort of he who is in the upward-reaching, graceful, continuous activity of incorporating or sweeping in a small object. . . ." In the second case, the differences in shape and size of parts of the total symbol express in a relatively undifferentiated manner the "difficulty, but eventual success, of an individual smaller than the object he catches, in the process of catching (all expressed by spirality upwards) . . . an organism larger than himself (all indicated by

the loop) . . . ." In the third case, the straight horizontal, dark, forked line expresses "he, serious-of-purpose, engaged in the direct forceful, harsh (because of the nature of the criminal) activity of catching . . . " etc.

If we examine in a general way the tendencies of our twelve subjects to express (a) invariance of verb with changing object, (b) slight modification of verb with changing object, and (c) fusions of verb and object, we find the following responses:

Activity (verb)	Invariant	Modification	Fusion
open	0	6	30
loves	0	11	25
catches	3	9	24
closes	0	2	34
Total	3	28	113

Since there are three contexts for each verb and twelve subjects giving responses, a total of thirty-six responses for each verb are categorized in terms of three steps along the dimension: invariance of verb to modification to marked fusion of verb and object. Invariance is characterized by the absence of change in the representation of the verb; modification is characterized by slight changes in the representation of an otherwise similarly symbolized verb; fusion is characterized by a radical change in the representation of the verb with each grammatical object. From the tabulation we see that most of the responses involve a marked variation in the expression of the activity with changing context; the invariance of the verb in the codified language is typically absent in the linear expressions.

We may elaborate on this discussion of the interpenetration of verb and object in relation to Navaho verbal codification. Kluckhohn (1948) describes their code as "an excessively literal language, little given to abstractions characteristic of English. The general nature of the difference between Navaho thought and English thought is that Navaho thought is prevailingly so much more specific, so much more concrete." This concreteness shows itself in the fact that verbs denoting a general action, such as "give," "go," etc., do not exist here. "The Navaho verb is rather like a tiny imagist poem; a word, with its verb stem as nucleus, more often than not has to be translated into English through a whole sentence." In particular, the verb stem is not a self-dependent form but shows its dependency on the object by its variation with the type of object participating in the event. Thus, there is no such thing as saying "I give" in Navaho; there are more than twenty different forms, one of which must be chosen to accord with the nature of the object given. These class stems embrace such categories as: the long-object class (pencil, stick, pipe); the slender-flexible object class (snakes, thongs, etc.); the things-bundled-up class (hay, bundle of clothing, etc.); the bulky-round class, and so on. This kind of codification is paralleled in its essential aspects by the above-mentioned line-codification of our subjects, where the linear presentation of verbal ac-

tivity is a function of the object. If such linear codification would be the basis for linguistic codification, verbal construction might be of a type similar to that of the Apachean languages with their characteristic classificatory verb stems (See Hoijer 1945; Sapir 1922:52). Just as the Navaho has two "gives" for "give-things-bundled-up-wise" and "give-bulky-round-object-wise," so one could translate the linear schemes for "catches" into "catches fly-wise," "catches lion-wise" and "catches criminal-wise."

Before discussing the second study using the technique of line schematization, we should like to refer again to Mrs. Lee's analysis of Trobriand language and cognition. After discussing the "self-contained" nature (we would say "fused-with-context" nature) of Trobriand concepts, she remarks: "Events and objects are self-contained points in another respect; there is a series of beings but no becoming. There is no temporal connection between objects. The taytu always remains itself; it does not *become* over-ripe; over-ripeness is an ingredient of another, a different being. At some point, the taytu *turns into* a yowana, which contains over-ripeness. And the yowana, over-ripe as it is, does not put forth shoots, does not *become* a sprouting yowana. When sprouts appear, it ceases to be itself; in its place appears a *silasata.* Neither is there temporal connection made—or according to our own premises, perceived—between events; in fact, temporality is meaningless. There are no tenses, no linguistic distinction between past and present" (Lee 1950:91).

In terms of empirical developmental formulations, the contextualization of concepts and the absence of temporal distinctions are closely interrelated. This is because abstract temporal distinctions codevelop with context-independent conceptualized objects. In other words, abstract time becomes, as Cassirer (1953) has pointed out, a network for conceptually systematizing the ever-changing flux of sense impressions.

We would therefore expect that in an experimental technique to bring to the fore the dispositionally present primitive forms of cognition, one would find that activities linguistically distinguished solely in terms of time would tend to be experienced as qualitatively different activities or, more conservatively, as activities which are conceived aspectively rather than temporally.

This would be consonant with the findings of historical linguists, who have treated the actual evolution of language. Thus Meillet writes: "The category of the *aspect* is more concrete than that of the *tense,* and, in the course of the history of Indo-European languages, one observes the aspect losing importance, tense gaining importance" (Meillet 1948:198).

With this background we may now turn briefly to the second study, one involving the line schematizations of variations in tense. Here we have used four verbs—runs, tries, yields, and loves, each presented in four tense formations, the simple present, the progressive present, the past, and the future tenses, e.g., "he runs," "he is running," "he ran," "he will run." From the viewpoint of English codification, the simple and progressive forms differ from the past and future solely in terms of time of action—the action remains invariant.

The preliminary results of this study indicate that on the level of what may

be considered a more primitive symbolization, we do not typically find representations of the same activity abstractly ordered through some simple indication of temporal difference, but rather modifications of the activity strikingly similar to what linguists have called "aspects." Thus, the past is often expressed by some device indicating "completedness" while the future frequently is represented by signs indicating "on-goingness," "incompletedness." Again, the two present tenses are typically represented by signs meaning "actual," "real," while the past and future are expressed through signs which mean for the subject "unreal," "not actual." The future and past are sometimes distinguished from each other in terms of signs indicating "desirability" and "nondesirability" respectively, etc. For some subjects, it might be noted, the fusion of activity with time is of such a complete character that they experience, as their symbolizations attest, not an identical activity differentiated solely in terms of time but a number of qualitatively different activities.

These two experimental studies seem to us to yield considerable information as to the structural characteristics of primitive forms of cognitive expression. For the developmental psychologist concerned with formal psycholinguistic processes, these experiments supplement data from other, nonexperimental sources to indicate why we regard certain linguistic patterns found in noncivilized cultures as reflecting mental operations more primitive than those reflected in the linguistic patterns of civilized man.

More concretely, accepting Sapir's profound observation that "at best language can be but the outward facet of thought on the highest, most generalized level of symbolic expression," those linguistic codes which externally involve a separation of agent and action, or invariance of activity independent of context, etc., taken in their "very fullest conceptual value" are developmentally higher than structures which do not have such features (Sapir 1921:14).

By the same token, it seems warranted to infer that dispositions to primitive forms of cognition coexist in civilized man with the possibility for more advanced forms potentially available to him through the collective codified language. It seems to us that civilized man is not, by his language, rendered incapable of employing developmentally quite primitive psychological operations; on the other hand, we believe that the linguistic apparatus of civilized man makes it possible for him to think on a conceptual level not readily attainable by noncivilized man without some change of his linguistic concepts.

In conclusion we hope that the present paper has clarified the nature of the developmental approach and has shown the relevance of an experimental developmental psychology of cognition to anthropological and ethnolinguistic data.

NOTE

[1] This article is based in part on a paper presented at a symposium with D. D. Lee at Vassar College May 4, 1955.

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