

**FOR FAVOUR OF EXCHANGE**

Centre of Advanced Study in Linguistics  
University of Poona

**STUDIES IN  
TRANSFORMATIONAL GRAMMAR**

*Edited by*

A. M. GHATAGE  
D. M. JOSHI  
PERI BHASKARARAO

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DECCAN COLLEGE, POONA  
1972

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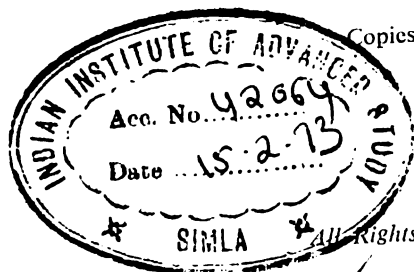
G 341 S

No. 2.

Studies in Transformational Grammar

Price Rs. 10

Copies 1000



16.1.82

Published by Dr. A. M. Ghatage, Director CASL, University of Poona,  
Deccan College, Poona 6 and Printed by Shri M. S. Latkar at Shrisaraswati  
Mudranalaya, Plot No. 76, 'E' Block, Bhosari, Poona 26.

## PRÉFACE

The Centre of Advanced Study in Linguistics of the University of Poona at the Deccan College held a Seminar on Transformational Grammar. During the first term of the academic year 1971-72 Dr. D. M. Joshi and Shri Peri Bhaskararao conducted a course in transformational grammar for the advantage of students of linguistics of the University on a voluntary basis. To round off this activity a seminar was called at the end of the term from 4th to 8th October 1971, a few scholars from other universities were invited to take part in it. The following persons participated: Dr. M. L. Apte, Dr. D. N. S. Bhat, Dr. C. J. Daswani, Dr. A. M. Ghatage, Dr. D. M. Joshi, Dr. C. Ramarao and Shri Peri Bhaskararao. Of the invitees Dr. Mrs. Yamuna Kachru, Dr. R. N. Srivastava, Dr. Bh. Krishnamurti, Dr. S. Agesthalingom and Dr. P. B. Pandit could not attend, though the first two submitted their papers to the seminar. Many members of the staff and the students of the class took part in the discussions. Eight papers covering a wide range of topics in the field of transformational grammar were read and discussed at great length. In the light of the discussion they were revised by the authors and they are now published under the title 'Studies in Transformational Grammar'. The work of editing was done by a committee consisting of the following persons: Dr. A. M. Ghatage, Dr. D. M. Joshi and Shri Peri Bhaskararao.

A. M. GHATAGE

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# THE TGS' CLAIM OF A REVOLUTION IN HL

D. N. S. BHAT

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The Transformational Generativists (TGs) claim that they have brought in a revolution in Historical Linguistics (HL) also, as they have already done in Generative Linguistics, and the two revolutions are closely intereconnected (POSTAL 1968). The main aspects of this former revolution appear to be (i) the refutation of the so-called regularity hypothesis of Neogrammarians mainly through the dethroning of analogical change (by showing that it is nothing but sound change), and (ii) the heralding of a new (or renovated) orientation to the theory of language change itself.

According to the regularity hypothesis, we are told, all sound changes or regular phonetic changes are purely phonetically conditioned. The TGs wish to refute this standpoint by showing that a number of sound changes that have actually taken place in languages could be nothing but morphologically conditioned (i. e. non-phonetically conditioned). This, they believe, would take the wind out of the regularists' baloon, and would show to the world that "the version of the Neogrammarian position on sound change so strongly advocated by BLOOMFIELD and generally accepted thereafter is mistaken" (POSTAL 1968 : 243); and as a result, "a reconsideration of the mass of work in historical phonology for almost a century would be required, work which is often considered among the most solid and unimpeachable results of linguistic science" (ibid : 239)

The proponents of the regularity hypothesis, as reported by POSTAL, evidently had a very good reason for postulating that the sound changes could have only phonetic conditioning. Because, once they accept morphological conditioning, there is nothing to prevent them from going further and accepting lexical conditioning as well, and this is nothing but throwing away the regularity hypothesis itself.

They were evidently aware of the existence of morphologically conditioned phonetic changes as well; these they have termed as analogical changes. It is very clear that the distinction between sound change and analogical change is the underlying conditioning factor, the former being phonetically conditioned, and the latter morphologically conditioned.

It is also clear that the distinction, as postulated by them, is *not* based on any quantitative factors: the actual number of lexical items affected by one or the other of these two changes is simply irrelevant. That, definitely, could not be the meaning of the term 'regular' as used in connection with the regularity hypothesis.

Hence the TGs' attempt to 'disconfirm' the regularity hypothesis (POSTAL 1968 : 245 ) by either showing that the phones could change under morphological conditioning as well, or that such morphologically conditioned changes are as 'regular' as phonetically conditioned changes has completely missed the point. The existence of such changes was already conceded by the regularists in naming them as 'analogical changes', and the quantitative aspect of those types of change was never under dispute.

The crucial point to be taken up for proving or disproving the regularity hypothesis is as follows : Is there any justification from the point of view of language change as such, to postulate a distinction between phonetically conditioned and morphologically conditioned phonetic changes? The traditionalists evidently considered such a justification to be existing, whereas the revolutionary TGs appear to deny it.

It appears that at least some of the traditionalists believed this justification to be partly causal. That is, they considered the underlying causes of phonetically conditioned phonetic changes and morphologically conditioned phonetic changes to be different. They assumed 'analogy' to be the basic cause of morphologically conditioned phonetic changes.

They also considered the analogical changes to be of two different types : (i) extension, and (ii) leveling. If a morphophonemic alternation introduced by a sound change is seen only in some of the bases or affixes belonging to a morphological class, (i) the alternation may get extended to all other bases of that particular

class, or (ii) it may get completely obliterated. Since the condition under which both these changes occur is the morphological class to which the bases or affixes belong, rather than the phonetic environment in which the changing phones occur, it has been argued that the change is basically different from other sound changes, both in their causation and in their underlying mechanism.

The TGs consider the analogical changes to be cases of rule simplification; (leveling modifies the 'structural change' of a rule, whereas the extension does not — KIPARSKY 1968); they do not think it necessary to separate them from other instances of rule simplification where the traditionalists see the interplay of a regular sound change.

However, the TGs do not give any definite reason for denying a separate existence for analogical changes. Their argument to the effect that such changes are nothing but cases of rule simplification is vacuous, as is also the case with their argument that morphologically conditioned phonetic changes are also sound changes.

Because, even if the TGs successfully prove that 'analogy' could not be the cause of all morphologically conditioned sound changes, one could still uphold the distinction (i. e. between phonetically conditioned and non-phonetically conditioned phonetic changes), as there could be other justifiable reasons for setting up such a dichotomy. And until all such factors are closely examined, there is no reason for discarding the regularity hypothesis which has served historical linguistics so well during the last hundred and odd years, weathering hundreds of criticisms leveled against it from all possible directions.

For example, the fact that certain changes are phonetically conditioned whereas certain others are not, could itself be an interesting justification for setting up the dichotomy. This is not as trivial a point as it appears to be. Quite a few phonetic changes with phonetic conditioning or no conditioning are found to occur in languages with scant respect for any of their grammatical rules. They cut across almost every conceivable grammatical rule of those languages. To argue that such changes could also be considered as grammatically oriented is nothing but deceiving oneself.

A distinction between changes occurring at the very end of a system of rules and those occurring at higher levels could possibly

be made in connectihn with the above aspect of change. And such a distinction could appear to be relevant for the TGs' theory of language change as well, and it may go parallel to the above two-fold distinction.

Some linguists have tried to differentiate between regular and sporadic sound changes — a differentiation that has quantitative as well as qualitative bases. GREENBERG and others, for example, have pointed out that the sporadic changes are generally of the type that could as well be termed as speech lapses; they are quite frequently effected by sounds at a distance; dissimilation is as frequent as assimilation; metathesis and the dropping of syllables or sounds are quite common; their field is also mostly restricted to a few consonants such as the liquids, nasals or sibilants. As against this, the regular sound changes are found to involve assimilations more frequently than dissimilations; their conditioning factors are more often immediate than distant, and more often the following than the preceding (1965 : 148).

There is also reason to believe that the two differ in their incidence as well — the regular changes occurring typically in the acquisitional stage of a language, and the sporadic ones in later utilizational stages (BHAT 1970). Such an assumption is strengthened by the theory of language acquisition generally accepted by linguists today (LENNEBERG 1967, CHOMSKY and HALLE 1968), according to which the ability to 'acquire' language is restricted to a particular age — an age in which the brain of the child possesses the adaptability and reorganization capacities.

However, the TGs' theory of language change cannot provide a basis for separating the sporadic sound changes from those of the regular variety. They do not appear to concede incidental differences as well, even though they do make a distinction between changes occurring in the acquisitional stage and those occurring at later stages.

We believe it inevitable that a theory which assigns the capacity to construct optimal grammars to a particular age of a speaker-hearer only, and which assumes the possibility of discrepancies creeping up between the competence and the performance of such a speaker-hearer at a later stage (CHOMSKY and HALLE 1968:294), will have to concede that there will always be discrepancies or differences occurring between the grammars of two

succeeding generations. Part of these differences would also be reflected in the performance of such generations; and depending on the possibility of a particular type of change occurring in the acquisitional or in the utilizational stage of the life of a generation, one can as well classify changes into two groups. It is to be seen whether the regularity hypothesis could be saved through an incidental dichotomy of the above nature.

The second aspect of this so-called revolution in historical linguistics is said to concern the orientation of the theory. This orientation is said to have shifted from performance to competence and then back to performance like a pendulum in the history of HL, which, we are assured, has now come to a standstill with competence as its last resort (KIPARSKY 1970:315).

This latter assumption regarding the orientation of the theory, namely that it now finally rests on competence as its basis is of rather doubtful nature because, the arguments on which it has been based are not at all satisfactory. The traditionalists' view is that a sound change is basically a change in the articulation of a sound, and the various changes occurring in the grammar, such as homophony, syncretism, morphophonemic alternation, etc. are secondary to it, and are to be considered as its effects.

As against this, the TGs argue that the so-called sound changes are basically changes in the competence of a speaker; he may add, drop, reorder or simplify a rule or set of rules belonging to his grammar, or as compared to the grammar of his parents. As a result, one notices a change in his speech, in his articulation of sounds and such other things. These are only the effects of rule changes (POSTAL 1968:269).

KIPARSKY'S and of the other TGs' argument against the traditionalists' view of sound change is based on one single point which was already discussed in detail above. KIPARSKY'S contention, for example, is that, if sound changes could be morphologically conditioned as well, i.e., if grammar rules are relevant for some of the sound changes, how are we to explain this relevance while at the same time considering them to be purely changes of phonetic entities? Thus, he considers a "performance theory" untenable against the position that "sound changes *can* depend on grammatical structure".

At the same time what he is apparently unaware of, however, is the fact that an exactly identical objection could be raised against his own "competence theory" of language change. If sound changes *can* take place with complete disregard to any of the grammatical rules of a language, how is it possible for a competence theory to remain tenable if it holds at the same time that all sound changes are grammar oriented, or effected through grammar changes? In fact the majority of sound changes that have so far been postulated are completely independent of any grammatical aspects. One has to search hard in order to discover a phonetic change with non-phonetic conditioning. Most sound changes hence stand strongly against a "competence oriented" theory of change.

It is thus doubtful whether any of the above two aspects of the TGs' revolution in Historical linguistics would make it necessary to "reconsider" the mass of work in historical phonology for almost a century. It does not make much difference, at least from the practical point of view, either to argue that a change takes place at the lowest level of a grammar, or to say that certain "sounds" have undergone a change. Secondly, if the TGs can conceive of an optimal grammar becoming less than optimal in the course of time through changes in the performance rather than in the competence, thereby creating a discrepancy between the two (CHOMSKY and HALLE 1968:294), it is difficult to see how such a position could be maintained by a theory which considers all changes to be competence changes. We believe that the pendulum that KIPARSKY has alluded to (1970:315) will have to swing again.

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# TRANSFORMATIONAL GRAMMAR AND LANGUAGE PEDAGOGY

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“ I think it ( the transformational-generative hypothesis ) has some implications ( for the teaching of language ), perhaps of a rather negative sort.... Our understanding of the nature of language seems ... to show quite convincingly that language is not a habit structure, but that it has a kind of creative property and is based on abstract formal principles and operations of a complex kind. ... from our knowledge of the organization of language and of the principles that determine language structure one cannot immediately construct a teaching programme. All we can suggest is that a teaching programme be designed in such a way as to give free play to those creative principles that humans bring to the process of language learning ... ” ( CHOMSKY - from *The Listener*, vol. 79.2044, 1968 ).

The rather long quote above outlines the views of Chomsky on the implications of transformational theory for language teaching. It would be tempting to end this essay here by claiming with Chomsky that the implications are of a negative sort and that it is impossible to design a language programme on the basis of the present insights of transformational theory. However, several adherents of the transformational theory have made varying claims about the application of the theory to language pedagogy ( LESTER, 1970 ). In this paper we propose to examine some of these claims and show that while the transformational theory has made significant strides in attempting to understand the acquisition of first language, it has nothing startling to say about the acquisition of a second language, much less about the designing of a language course.

A considerable body of research on applied transformational grammar concentrates on the teaching of the first language ( $L_1$ ) to native speakers as a part of the school curriculum, having largely to do with teaching composition, literary analysis, etc. There is relatively little material available on the implications of transformational grammar for teaching of second language ( $L_2$ ) to adult learners. In this paper we will restrict ourselves to a consideration of the implications of transformational theory for the teaching of  $L_2$ .

To return to the quote above, Chomsky asserts that the transformational theory has shown quite convincingly that language is not a *habit structure*, but has *creative property*. 'Habit structure' here refers to the behaviourist viewpoint which characterizes language as a set of habits that are, typically, learned in a stimulus-response situation. The behaviourist theory accounts for language acquisition in terms of 'learning theory' (SKINNER, 1957). Skinner's (1957) work actually marks the culmination of the influence of behaviourist psychology on related disciplines like linguistics. For over two decades before Skinner's book this theory was the most widely accepted explanation of language acquisition by the structural linguists who reflected the behaviourist attitude in their attempt to describe linguistic structure in terms of step-by-step segmentation and classification of language data. Chomsky (1957, 1959) first of all rejected the claims of both the structural (or taxonomic) linguistics and behaviourist psychology and asserted that they were both inadequate. Particularly, in contrast to the learning theory of the behaviorists, Chomsky (1968) claims that language is creative, and that the human child's ability to acquire any natural language and an observation of the development of language in a child are compelling reasons for positing the theory of innateness of language. Both the behaviourists and the transformationalists (both whose claims we will discuss below) extend their particular hypotheses about  $L_1$  acquisition to the acquisition of  $L_2$ . Consequently, in order to understand the implications of the behaviourist and transformationalist hypotheses for second language learning, we must examine the two theories of  $L_1$  acquisition. However, before we do that, it would be profitable to briefly describe the linguistic development of the human child.

From almost the day it is born the human infant is surrounded by a language (in its proper social context) that he is going to



learn as his native language. The child's parents ( particularly the mother ) expose the child to their language even when they are aware that the child is not yet ready to communicate with them. Without going in to the details of how the child's ( non-linguistic ) responses develop, it is interesting to note that by the time the child arrives at the babbling stage he has been exposed to several months of listening to the  $L_1$ . During this stage the child learns to respond positively to the language around him by isolating for repetition the sounds of his language either individually or in some minimal sequences. At first the sound sequences do not strictly match the morphemes or words of his parents' language, but very soon the child learns to identify several physical objects and is able to apply the correct linguistic labels to them. At this stage the child may be said to be uttering one word sentences, for his single words are certainly holophrastic. What is highly significant is that at this stage, the child is able to understand far more than he is able to produce. By the time he is a-year-and-a-half old the child is able to produce utterances of two or more words. By this time also the child has mastered a minimal sound pattern of his language. After this stage, the linguistic development of the child becomes greatly accelerated until by the age of four he has mastered the basic syntax of his language, has mastery over a fairly extensive vocabulary and is able to understand and produce an impressive number of novel sentences. He has generalised for himself the rules of his language. What he learns after this stage has to do largely with the expansion of his vocabulary and performing 'transformations' on the 'kernel' sentences. A couple of points of detail may be noticed in this description: the language ( i.e. sentences ) that the child hears during this period from his parents and others are mainly incomplete or semi-grammatical sentences. Parents tend to mutilate the syntax and phonology of the adult grammar when they attempt to communicate with the child, e.g. in their use of baby-talk. Also throughout this language acquisition period, the child 'practices' his language a great deal, both with his parents and by himself ( WEIR 1962 ).

Let us now see how the behaviourists and transformationalists interpret these observable facts and theorize about  $L_1$  acquisition. The learning theory which is associated with the behaviourist psychology views the acquisition of language at all levels—i.e. phonology,

syntax, meaning – as ‘conditioning’ of ‘responses’ made by the child in a ‘stimulus-response’ situation by a ‘progressive approximation’ to the ‘stimuli’ the child finds in his ‘environment’. In the acquisition of phonology, for instance, the child is said to learn the ‘sounds’ of his native language, by selecting from a large repertoire of sounds available to him as physical reflexes, through ‘association’ and ‘reinforcement’. Once the specific phonetic motor habits have become ‘stamped-in’ through repetition ( which is constantly ‘rewarded’ or ‘punished’) he learns to put these sounds together as words, once again through the reinforcement provided by his parents (i.e. environment). Within this theory the acquisition of words (i.e. acquisition of meaning) is seen as association of a unique concatenation of sound elements with a referent in the physical world. Extension of meaning is viewed as a generalization of his sound ( word )– referent association. Acquisition of syntax is seen as stringing together of words in a particular order where the order of elements in a sentence is accounted for in terms of probability of occurrence. The child’s ability to utter novel sentences is again explained as a process of generalization where the child has been able to generalize the grammatical function that words have in structural patterns of his language.

In the behaviour theory, acquisition at all the levels of language is seen to proceed from the surface to the deep structure where the environment ( parents, the physical world, etc.) and stimulus-response learning play a very significant role. The learner is seen as participating in the learning situation as a passive organism whose primary rule is to imitate and practice the verbal stimuli in his environment. It must be pointed out, however, that even within this theory the child is seen as being equipped with certain language learning capabilities, but these capabilities are shaped by the language that the child is exposed to.

After Chomsky (1959) first demonstrated the inadequacy of the behaviour theory of language learning, several scholars have provided further proof that the learning theory is not capable of explaining adequately how human children acquire their L<sub>1</sub> (LENNEBERG, 1967; McNEILL, 1966; SLOBIN, 1966). Specifically, it is claimed that it is unlikely that a human being learns the sound pattern of his language by first learning the ‘significant sounds’ of his parents’

language and then putting them together in words. It is further argued that if this were true, the child's own first words would be physically invariant, but this is not so. Probably the child is equipped to ignore phonetic variance in specific contexts. Almost definitely the child learns the phonological pattern of his language as a system with its hierarchical structure rather than as a list of sounds. It is argued that if the learning theory model for acquisition of meaning is accepted then it becomes impossible to account for extension of meaning which is so common in natural language. For example, the word *mouth* in the *mouth of a river* can not have been learned through conditioned response, nor could it normally be learned separately from the word *mouth* in sentences such as *This is my mouth*, *Show me your mouth*, etc. *Mouth* in the *mouth of a river* is an extension of the original word *mouth*. The learning theory attempts to account for such extension of meaning by invoking 'internal' conditioning where the individual is said to develop some internal similarity between the original word and its non-physical internal counterpart. An obvious shortcoming of this explanation of extension is that the theory can not specify the nature of the conditioned responses from the original meaning to the extended meaning. Moreover, within this theory it is impossible to predict extensions; one can only rationalize an extension after it has occurred.

It is argued by the transformationalist-psychologist that it would be more satisfying to say that "words tag the processes by which the species deals cognitively with its environment" (LENNEBERG, 1967, p. 334). The implication of this viewpoint would be to say that the word *mouth* refers to a class of cognitive processes which has been identified and categorized independently of the verbal label. Every new word learned acquires meaning from the cognitive process which it refers to and which the learner already possesses. Extension of meaning and metaphorization can then be explained in terms of providing labels already available to related cognitive processes which are possessed by the speech community or, indeed, the whole species. A cognitive theory of meaning would explore the ways in which cognitive development takes place, how human beings categorize and differentiate the universe, and how these cognitive operations find linguistic expression. The enumeration of cognitive processes would yield universal features of cognition, and the expression of these processes in specific languages

would yield language-specific transformational rules for the mapping of universal features onto specific linguistic units ( JAKOBOVITS, 1968 ).

The notion that the acquisition of syntax is learning of surface structure ordering of sentence elements according to their sequential probabilities, is also rejected by the transformationalists on the ground that there is no evidence that surface structure order always uniquely reflects deep structure relationships.

There is evidence that surface structure order, characteristically, does not reflect deep structure relationships which are crucial for semantic interpretation of sentences ( LENNEBERG, 1967, P. 273 f ). Sequential probabilities of order of elements, therefore, can have no role in language acquisition.

It is not enough to reject the learning theory as inadequate; one must propose an alternative theory of language acquisition. As Chomsky puts it: "... sentences may have very similar underlying structures despite the great diversity of physical form, and diverse underlying structures despite similarity of surface form. A theory of language acquisition must explain how this knowledge of abstract underlying forms and the principles that manipulate them comes to be acquired and freely used." ( CHOMSKY, 1968 ). It has been pointed out by McNeill ( 1966 ) that two-word utterances of a-year-and-a-half old children show that the combinations of words in these utterances are non-random. A distributional analysis of these items shows that the words can be classed into two categories. One category ( called pivot class ) consists of a small number of words that can occur only with a member of the second category ( called open class ) which consists of a larger number of words that may occur with or without a member of the pivot class. Items attested in the pivot class include words like *big, my, two, a, this, here,* etc., and the items in the open class include words like *boat boy, shoe, baby, milk,* etc. The child combines the items of these two categories freely according to a rule, which he has obviously built for himself and which may be represented as:

$$S \longrightarrow ( P ) + O$$

As the child grows, he progressively subcategorizes the pivot category in a fairly systematic way where, evidently, he seems to follow a kind of specific classification. Particularly, the words of the

pivot class are further subdivided into *articles*, *demonstratives*, and *others*; and at a later stage the *others* are further subdivided into *adjectives*, *possessives* and *others*, and so on. What is significant to note here is that the combinations of two words that the child generates according to the rules of his grammar are often ungrammatical according to the rules of adult grammar ( e. g. *big milk* ), hence it is unlikely that the child could have heard such utterances and imitated them.

The human child's ability to progressively subcategorize more abstract ( or generic ) categories into successively less abstract ( or specific ) sub-categories leads McNeill ( 1966, pp. 35-36 ) to conclude that the human child is endowed with a set of linguistic universals which direct him to discover in a hierarchical manner the grammatical classes of the language he hears. This claim about the innate ability of the child to learn his language because he is wired for some abstract linguistic universals is a very strong claim which has by no means been universally accepted by all psychologists or linguistics ( PUTNAM, 1968 ; GOODMAN, 1968 ). The notion of innateness, however controversial, is central to the transformational theory. It is in terms of innateness that aspects of linguistic competence such as the creative property of language, abstract nature of deep structure and universality of certain mechanisms of human language are explained. It is important to note that when the transformationalists invoke the notion of innateness they do not discount the role of experience ( environment ): "... the schematism assigned as an innate property to the language-acquisition device determines the form of knowledge ( in one of the many traditional senses of 'form' ). The role of experience is only to cause the innate schematism to be activated, and then to be differentiated and specified in a particular manner" ( CHOMSKY, 1968 ).

The other important factor in language acquisition that transformationalists underline in the development of linguistic competence of the human child is the use of transformations. Lenneberg ( 1967 ) has argued that transformations form an essential part of the categorization processes of all biological organisms. Linguistic transformations, which enable the human learner to manipulate the relationship between sentences that are grammatically related, are acquired at a relatively late stage in the development of language competence ( MCNEILL, 1966 ).

The claim, that the child with the innate ability to learn a language performs a matching operation between the universal categories he is wired for and the grammatical classes of the language he hears, excludes the role of imitation and repetition which is considered so central by the behavioural psychologists. But even if the theory of innateness is accepted, does the human child use repetition ( or practice ) as a device for strengthening the novel forms of the language that he has acquired ? There is some evidence to show ( LENNEBERG, 1967, p. 316 ) that the child does not readily imitate a novel utterance that he hears from adults around him. Also, once he has discovered a general rule that accounts for the forms he has learned, then this rule seems to take precedence over the practice of a novel form through repetition. For instance, in spite of all the practice that a native English child has in the use of irregular past tense of verbs ( like *stood, came, went*, etc. ) at the early stages of acquisition; he discontinues what he has long practiced and uses the regular though unacceptable forms ( like *standed, comed, goed*, etc. ) once he has generalized the past tense formation rule.

However, there is evidence ( WEIR, 1962 ) that children engage in practice and repetition in language on their own. They often build what sound like pattern and substitution drills at the levels of phonology and syntax. Similarly, contextual expansion of the child's utterances by the parents ( Child : *baby cry...* Mother : *yes the baby is crying* ) constitutes conscious teaching on the part of the mother. Also, the fact that children of educated and articulate parents develop faster linguistically would seem to point to the positive role of practice and conscious teaching.

Both the behaviorists and transformationalists extend their respective theories of  $L_1$  acquisition to the acquisition of a second language. The behaviourists emphasize imitation, repetition, conditioning and so on. The structural linguists who accepted the learning theory tended to build their language courses with a view to providing 'drilling' in the  $L_2$  in the form of substitution drills and so on. The transformationalists, on the other hand, argue that since acquisition of  $L_2$  is not significantly different from the acquisition of  $L_1$ , an  $L_2$  teacher need only replicate the  $L_1$  conditions.

However, it seems fairly obvious that the two situations are different and therefore a summary decision on the sameness of the

two situations does not solve the problem. The factor of motivation alone makes the two situations vastly different from each other. The child acquiring his  $L_2$  is pursuing an activity which is crucial for his survival, while for the  $L_2$  learner his motivation for learning the language and his attitude towards the  $L_2$  will determine his success in acquiring the  $L_2$ . A consideration of the differences between a child learning his  $L_2$  and an adult learning an  $L_2$  raises the question of the ways in which the  $L_1$  learner is different from an  $L_2$  learner. An  $L_2$  learner, especially if he is an adult learner, is cognitively more developed than the child learning his  $L_1$ . Also the  $L_2$  learner is in possession of the first language whose structure (phonological, syntactic and semantic) may facilitate or interfere with the learning of  $L_2$ .

The advanced cognitive development of an adult  $L_1$  learner would seem to have little significance for the transformationalist since, according to the transformationalist view, language acquisition has little to do with the outside world but is dependent on the innate ability to learn a language. This, however, is totally untrue, because the advanced cognitive development of the  $L_1$  learner should provide numerous short-cuts for learning of the  $L_2$  especially at the level of vocabulary, and the  $L_2$  learner should have considerable facility in grasping the mechanism of extension of meaning and metaphorization in the  $L_2$ .

The other major difference between the two learners is that the  $L_2$  learner has competence in his  $L_1$ . In a general sense the possession of  $L_1$  structure raises the question of transfer of  $L_1$  structure into  $L_2$ . The nature of transfer, both positive and negative, is very little understood at present. That the structure of  $L_1$  influences the acquisition of  $L_2$  is undeniable, but how this happens is largely unknown. The level at which the  $L_1$  seems clearly to influence the  $L_2$  is phonological production in  $L_2$ . A contrastive analysis of the two languages involved in an  $L_2$  situation is never an effective guide to the direction and extent of transfer. Above all, it is difficult to predict on the basis of contrastive analysis, whether the  $L_2$  learner will produce or confuse certain structures in the  $L_2$ . Specifically, a contrastive analysis of English and Hindi might lead one to hypothesize that a native speaker of Hindi will produce SOV structures in his  $L_2$  English instead of the usual English SVO. There is no evidence

that this, in fact, happens in an  $L_1$  Hindi -  $L_2$  English situation. This raises the question whether transfer takes place at the level of deep structure or surface structure, or is interference the result of the deep structure of one language interfering with the surface structure of the other? It is significant to note, of course, that it is difficult to identify, in an  $L_2$  situation, the extent of positive transfer. In other words it would be difficult to quantify facilitative transfer in an  $L_2$  situation. Indeed, it is difficult to predict even the extent of interference on the basis of contrastive analysis of the two languages.

On the other hand, it may be argued that the possession of  $L_1$  would mean that the  $L_2$  learner has a learning strategy available to him which he might successfully employ in learning the  $L_2$ . However, it is quite possible that the learner keeps the two codes quite distinct, and in learning the  $L_2$  uses a conscious strategy which may or may not match the strategy an  $L_1$  learner uses unconsciously. Also the strategy an  $L_2$  learner employs is sometimes determined more by the course writer and the language teacher rather than the learner.

At this point it might be profitable to consider the question of understanding versus production in  $L_2$ . It is claimed (MCNEILL, 1966) that in  $L_1$  acquisition grammatical comprehension precedes grammatical production. Intuitively, it seems right to assert that in the  $L_2$  learner the ability to comprehend the  $L_2$  is far more developed than the ability to encode in the  $L_2$ . Of course, the priority of grammatical comprehension in the two situations may be the result of quite distinct phenomena or mechanisms. In the  $L_1$  learner, it might be attributed to the gap between competence and performance, while in the  $L_2$  learner grammatical comprehension may result from his cognitive development, his competence in  $L_1$  or purely a factor of the context in which he hears the  $L_2$ . What this claim assumes is that the  $L_2$  learner's analytic ability is more pronounced than his synthetic ability.

We must now turn to the implications of transformational grammar in the actual designing of an  $L_2$  teaching course.

It has been argued (NEWMARK, 1963) that the findings of transformational grammar may be used to organize an  $L_2$  course better than courses designed on 'structural' grammars. Newmark



( 1963 ) argues that courses designed on structural linguistics tend to be more concerned with structural habits at the cost of presenting language in context. He suggests that the transformational grammar would be more tempting to use in the language courses and classroom teaching. It is suggested that the sequence ( grading ) of materials included in a language course may follow the rules of a transformational grammar of that language. Specifically, the language course might teach kernel sentences before expansions and transformations; introduce new vocabulary in kernel sentences only; and delay teaching phonology which is the last stage in the cycle of rules of a transformational grammar.

Grading of teaching materials in an L<sub>2</sub> course that is based solely on the order of rules in a transformational grammar may result in sequencing of materials that may be inefficient and wasteful in the sense that the rule ordering may require the course designer to teach a less frequent item before a more frequent item. To take a simple example : in an L<sub>2</sub> English course, rules of grammar would require the designer to introduce the *modifier + noun* structure at a fairly late stage since this would be considered a transformation which results from several kernel sources; similarly the *noun + possessive + noun* structure would be introduced at a fairly late stage in the course since this too is a transformation. But the purposes of the particular course might demand of the course that the possessive structure be taught fairly early. It is quite clear that rules of a transformational grammar do not reflect either the order in which the child acquires the patterns of his language or the frequency of occurrence of specific structures. It is quite possible that some of the transformations of an adult grammar are initially learned by the child as phrase structure rules and are generalised as transformations when the child has acquired a fuller grammar of his language. This would be supported by the observation that transformations are acquired at a fairly late stage in L<sub>1</sub> acquisition. Frequency of occurrence, on the other hand, is a crucial factor in grading the materials in a language course. Admittedly, the rules of a transformational grammar do, in a broad sense, provide a sequence that starts with the simple and ends with the complex syntactic patterns, but this is motivated more by theoretical assumptions than by any psychological or pedagogical assumptions.

The suggestion that since phonological rules come last in the

cycle of rules in a transformational grammar, teaching of phonology should be delayed is also too general and seems to ignore the facts of language acquisition. It is fairly widely accepted that for a non-specialized  $L_2$  course it is desirable to teach the spoken language before the written language. In order to delay the teaching of phonology, one would necessarily have to begin with the written language and wait for the learner to acquire a large part of the syntactic rules before teaching him the phonology. This is obviously counter-intuitive. It might be conceivable that in a specialized  $L_2$  course (e.g. one designed to produce translators of historical documents in the  $L_2$ , or one designed to assist scientists to *only read* professional materials in the  $L_2$ ) the teaching of phonology may not be primary but in such courses phonology is often inessential. In any course that has spoken ability in the  $L_2$  as one of its goals, it would seem crucial to introduce the spoken language at the initial stages. Also, the fact that phonological rules come late in the cycle of rules in a transformational grammar has to do with the theoretical assumptions and limitations of presentation rather than with the psychological or pedagogical assumptions. It is important to note that the child learning his language does not first acquire his syntactic rules and then learn to pronounce his language. The process of learning at various levels is complex and simultaneous. In fact, if one has to understand that there is some similarity between  $L_1$  and  $L_2$  acquisition, then it would seem to be crucial that the  $L_2$  learner be presented with the spoken language in order to be able to formulate for himself the rules of grammar of the  $L_2$ . If, on the other hand, the delaying of the teaching of phonology is understood as de-emphasizing phonology in an  $L_2$  course, it would still depend on the goals of a specific  $L_2$  course whether or not such de-emphasis would defeat the purpose of the course.

The suggestion about the introduction of new vocabulary in kernel sentences only appears to be quite tenable and we have nothing more to add.

It has been suggested (NEWMARK, 1963) that it is fairly easy to write transformational drills which makes transformational grammar more tempting to the language teacher. This is a weak argument, for it is not the ease of producing teaching materials that

is crucial in designing a language course but the efficiency of the teaching material. A language course has to be based more on factors like interest, sufficiency and the needs of the language learner. Anyone who has produced a language course knows that what is easiest to produce is not necessarily the most efficient.

It has also been claimed that transformational grammar more than the structural grammar emphasizes language teaching in natural context (NEWMARK, 1966; NEWMARK and REIBEL, 1968). It is well known that structural linguists also emphasize the use of language in context, although most structural courses tend to become sentence-grammar courses (RICHARDS, 1968). The structural grammar tends to isolate linguistic forms from natural context and drill the learner in manipulating formal properties of sentences as though language acquisition depended on mechanically producing the terminal strings in isolation. Transformational grammar, on the other hand, emphasizes the native speaker's ability to exploit the relatedness of deep structure of sentences. However, so far the transformational theory has no machinery for analysis of context, and until that is possible, transformational grammar too, like the structural grammar, tends to emphasize syntax where the basic unit of analysis is the sentence. In fact, the transformational grammar emphasizes the syntactic component at the cost of the semantic (or contextual) component. Scientific analysis of context is a real desideratum in modern linguistics.

Finally, we would like to consider the place of repetition and semigrammatical sentences in an  $L_2$  course. The importance of repetition for the  $L_2$  learner is normally recommended for automatizing the motor habits necessary for producing novel sound sequences in the second language. Automatizing of grammatical structures is very little understood at present, and what is often designed to provide automaticity in grammar (i.e. pattern drills) *may*, in fact, achieve *only* automaticity in phonology. Obviously, in order to provide automaticity in grammar through pattern drills, a language course would have to provide a very large number of pattern drills for the learner. The role of transformation drills (i.e. manipulating a set of related sentences) in automatizing grammatical structures for the  $L_2$  learner would seem, theoretically, to be of importance. However, no reliable study to assess the effectiveness of transformation drills has yet been done.

A child learning his  $L_1$  hears a large number of semi-grammatical sentences. He is able, on the basis of these sentences, to build the grammar of his language and generate grammatical sentences. He is also able to correctly interpret semi-grammatical sentences, once he has acquired the grammar of the language. It would be interesting to discover how far it is possible to introduce, if at all, semi-grammatical sentences in an  $L_2$  course. If the ability to develop competence in well-formed sentences from semi-grammatical sentences is a stage in the development of the child, it might be argued that the adult learner of an  $L_2$  should be encouraged to both produce and encounter semi-grammatical sentences. Clearly this is an area where a considerable amount of research is necessary. It may turn out that it is not essential to replicate for the  $L_2$  situation all the conditions that exist in the  $L_1$  situation.

We have tried to show in this paper that while rejecting the learning theory the transformationalists have proposed a theory of language acquisition which is able to explain more adequately some of the facts of language learning. The extension of the transformational hypothesis of  $L_1$  acquisition to  $L_2$  acquisition does not explain all the facts. In the application of transformational theory to second language teaching the claims of transformational theory are not fully justified.

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# THE TADDHITA FORMATION AND THE TRANSFORMATIONAL APPROACH

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One of the main functions of grammar is to assign the correct structural label to the elements of the string generated by it. While the process of generating well-formed strings is the essence of grammar for the speaker, its structural description is central to the hearer, on which depends the understanding of the utterance. One such crucial situation is produced by ambiguous expressions, which admit of two or more mutually exclusive interpretations and hence demand some kind of explanation by which different structures can be assigned to them. All levels of language permit such a situation to develop and at the grammatical level the standard procedure is to postulate a different deep structure for each separate interpretation and explain the ambiguity as due to the merger of all such deep structures into a common surface structure of the utterance. The question of setting up three distinct levels of structure, the deep structure, the semantic structure and the surface structure, depends upon the extent to which the deep structure is formulated as a grammatical level as distinct from its meaning or the purport conveyed by it.

Sanskrit grammarians like Pāṇini Kātyāyana and Patañjali have touched upon some of these aspects in their treatment of the Taddhita formations or secondary derivations of Sanskrit, dealt with in the 4th and 5th Adhyāyas of the Aṣṭādhyāyī. A study of the procedure followed by them is likely to highlight the basic aspects of the problem and indicate their views on it. It must be emphasised at this stage that these grammarians do not formulate their procedures in the way in which a modern transformationalist would do it, but all the essential elements of such a procedure are present

there, though worded in their own way. In this paper ambiguous secondary derivatives of Sanskrit will be dealt with in some detail.

An ambiguous derivative expression can arise under two circumstances. (i) A suffix expressing a particular meaning may be dropped after a basic word with the result that the original word retains its primary sense and also acquires the additional meaning of the suffix which no more exists and thus becomes ambiguous. (ii) Some times the suffix added to the basic word may be extended to other words but with the same meaning or may be added to the basic word with a different meaning in which case alone an ambiguous expression results. In both these circumstances the same secondary formation gives rise to two distinct and mutually exclusive interpretations. The other operations used by the grammarians in this context, like the use of alternative suffixes or assigning different meaning to a derivative under different conditions do not give rise to ambiguity and are left out in this discussion. While summarising the views of the grammarians here, merely technical discussion is also left out and only the facts of the language bearing on the problem are stated.

The first type of situation is met with in the following cases.

P. 4.1.88. After a dvigu compound no taddhita suffix like *an* is added in the various meanings enumerated except in the sense of *apatya* or a son. Thus words like *pañcakapāla*, *daśakapāla* are formed with the meanings 'a sacrificial cake prepared on five or ten pot sherds'. So also are formed words like *dviveda triveda*, in the sense of one who has studied two or three vedas.

P. 4.1.90. The suffix which forms a *yuvan* derivative is lost when followed by suffixes beginning with a vowel in the various senses enumerated. Here follows a complicated relationship between the name of a person, his son, his descendents called *yuvan*, and his pupils. As *Kāśikā* explains it with an example: *bhāgavittasya apatyam bhāgavittiḥ / tasya apatyam yuvā bhāgavittikaḥ / tasya chātrā bhāgavittāḥ*. Thus *bhāgavitta* stands for the person himself as well as for a pupil of the descendent of his son. It should be noted that as the *yuvan* suffix disappears before other suffixes, the identity of form may not always refer to the same two generations. Thus in the case of the series *tikasya apatyam taikāyaniḥ / tasya*

apatyaṁ yuvā taikāyanīyaḥ / tasya chātrāḥ taikāyanīyāḥ the identity of expression is between the yuvan descendent and his pupil.

P. 4.1.109. The suffix yañ is lost in case of the feminine word. What is meant is this. Vataṇḍa, as a member of the Āngiras clan has a patronimic formed as vātaṇḍyaḥ. But when the reference is to a female child it remains vataṇḍī without any derivative suffix. It is thus presumed that vataṇḍī may thus stand for the wife of vataṇḍa as well as a female descendent of his.

P. 4.1.175. After the word Kamboja the so-called tadrāja suffix disappears. Thus this word means the tribe as well as their king.

P. 4.1.176. The suffixes, ñyaṁ and ñya are lost after avanti, kuntī and kuru, if the word refers to a woman. Thus avanti, kuntī, and kurū refer to the female members of the tribes as well.

P. 4.1.177. The same thing happens if the basic word ends in -a. Thus śūrasenī and madrī mean the princesses of the tribes śūrasena and madra.

P. 4.2.4. The secondary suffix after a word meaning a lunar constellation is lost if no specific time is meant. Thus adya puṣyaḥ means 'today is the time when the moon is in conjunction with the constellation puṣya'. Adya kṛttikāḥ means 'today is the time when the moon is in conjunction with the kṛttikās'.

P. 4.2.5. The suffix is also lost after the words śravaṇa and aśvattha, when a name is implied. śravaṇā rātriḥ means a night of that name and aśvattho muhūrtaḥ means an auspicious moment of that name.

P. 4.2.64. The suffix meaning 'one who studies or knows' is lost after the name of a book which is named after its author. Thus pāṇīniya stands for one who studies or knows the work called pāṇīniya written by Pāṇini and the work itself.

P. 4.2.65. This suffix is also absent after the name of a sūtra ending with the letter ka. Aṣṭaka refers to the grammar of Pāṇini written in the sūtra form and having eight chapters. Those who study it are also called aṣṭakāḥ.

P. 4.2.81. No suffix is used after the name of a people to refer to their country. Thus pañcālānāṁ nivāsaḥ janapadaḥ



pañcālāḥ. It should be noted that the word does not change its number or gender when referring to the country.

P. 4.2.82. The same is true in the case of word like varaṇa. Kāśīkā says : varaṇānām adūrabhavam nagaram varaṇāḥ. It thus stands for the trees as well as the town close to them.

P. 4.2.83. In case of the word śarkarā there is an optional loss of the suffix. Thus we have two words śarkarā and śarkaram meaning a country full of gravels.

P. 4.3.34. The suffix meaning 'born at the time of' after the names of the constellations śraviṣṭha, phalguna, anūrādhā, svāti, tiṣya, punarvasu, hasta, viśākhā, āsāḍha, bahula, is lost. Thus śraviṣṭha, phalguna etc. mean persons born in those times. If the person is a male or a female, the formal identity of the form will differ from one nakṣatra to another.

P. 4.3.35. The same suffix is dropped after words ending in sthāna and the words gośāla and kharaśālā. One who is born in a gosthāna is called gosthānaḥ. So also the words geśālaḥ and kharaśālāḥ mean persons born in these places.

P. 4.3.36. The suffix is optionally lost after the words vatsaśālā, abhijit, aśvayug and śatabhiṣaj. The form is identical in the last three cases but there is a difference of gender in the first word. The word vatsaśāla can also be accepted as suggested by the Nyāsa.

P. 4.3.37. Mostly the suffixes are lost after words expressing nakṣatras. Thus we have rohiṇaḥ or rauhiṇaḥ.

P. 4.3.107. The suffixes after kaṭha and caraka are lost. So kaṭhena proktam adhiyate kaṭhāḥ / So also carakāḥ.

P. 4.3.163. The suffix is dropped in the sense of the fruit of a tree, after the word expressing the tree. Thus badara stands for both the tree and the fruit.

P. 4.3.166. The suffix of the same meaning as above is lost after the word jambū, which thus means both the tree and the fruit.

P. 4.3.167. The same is true in case of plants like haritakī etc.

P. 4.4.24. After the word lavaṇa, the suffix meaning 'mixed with' is lost. So, lavana means both salt and salty.

P. 4.4.79. The suffix *kha* is lost after the word *ekadhura*. This is considered as optional and we have two forms *ekadhuraḥ* and *ekadhurīṇaḥ*.

P. 5.2.60. The suffix *cha* in the sense of possessing is lost after words *adhyāya* and *anuvāka*. Thus *gardhabhāṇḍa* means that word as well as the chapter in which that word occurs. This is considered as optional.

P. 5.2.105. If a country is to be described as full of sand *sikatā* or gravel *śarkarā*, no suffix is added. *sikatā deśaḥ*, *śarkarā deśaḥ*.

*Kātyāyana* extends the scope of *lopa* in the following additional cases.

P. 4.1.128. The suffix is dropped after the word *caṭakā* when the offspring is female. *caṭakāyā apatyam̐ strī caṭakā*.

P. 4.1.175. As in the case of *Kamboja*, words like *Cola*, *Kerala*, *Śaka*, *Yavana* stand for both the tribes and their kings.

P. 4.2.60. In the sense of 'he studies it or knows it' the suffix is elided in *sarvavedaḥ*, *sarvatantraḥ*, *savārtikaḥ*, *sasam-grahaḥ*, *dvivedaḥ*, *pañcavyākaraṇaḥ*.

P. 4.3.60. The suffix *ṭhāñ* is dropped after the word *sthāman*, *aśvatthāmā* 'one who has the strength of a horse'.

P. 4.3.87. The suffix meaning 'the story of' is lost, thus giving rise to words like *vāsvadattā*, *sumanottarā*, standing for both the stories as well as the heroines of these stories.

P. 4.3.166. In the context of the loss of the suffix in the sense of the fruit of a tree, the meaning of dried grain should be included. Thus we have words like *vrihayaḥ*, *yavāḥ*, *māśāḥ*, etc. standing for both plants and the grains. In the next *vārttika* the rule is extended to cover flowers also. Hence *mallikā*, *kadambaḥ*.

P. 5.1.111. The suffix *cha* is dropped after words like *puṇyāhavācana*. Thus *puṇyāhavācanam*, *svastivācanam* stand for both the ceremonies and their purpose.

P. 5.2.37. The suffix is lost after words meaning 'measure'. *Vitasti* stands for a span as well as a thing measuring a span. This is true also of a *dvigu* compound. *dvivistasti* 'a thing of two spans'.

P. 5.2.94. The suffix *matup* is lost after words meaning 'quality'. *Śukla* means 'white' as well as 'the white colour'.

As is to be expected the cases where the extension of the meaning of a suffix causes ambiguity are few.

P. 4.1.93. The same patronomic suffix denotes all the successive generations. *Kāśikā* explains : *gargasya apatyam gārgiḥ / gārgerapatyam gārgyaḥ / tatputro 'pi gārgyaḥ*. Thus once a derivative like *gārgya* is formed to mean 'the son of *gārgi*' no further derivation is possible and all the further descendents will be called *gārgyas*.

*Kātyāyana* adds :

P. 5.1.71. After the words *yajña* and *ṛtvik* the suffixes *kha* and *ghañ* also mean 'deserving of the works of these'. Thus while *Pāṇini* takes *yajñiyaḥ brāhmaṇaḥ* to mean 'a Brahmin worthy of performing a sacrifice', *K.* adds *yajñiyaḥ deśaḥ* in the sense of a country worthy of having a sacrifice performed on it. So also *ārtvijīno brāhmaṇaḥ* means 'a Brahmin deserving of a priest and 'he who is worthy of performing the duties of a priest'.

P. 5.1.74. The suffix *ṭhañ* is also used after *krōśasata* giving the derivative *krauśastika* in the sense of 'able to go a hundred *krōśas*' and *yojanaśata* giving *yaujanaśatika* 'able to go a hundred *yojanas*', *K.* says that they also mean 'worthy of being approached from a distance of hundred *yojanas* or *krōśas*': *tato 'bhigamanam-arhati*.

A close scrutiny of all these cases shows that all of them do not give rise to homonymous derivatives. Thus *pañcakapāla* in the sense of 'five pot sherds' does not exist and assumes the form of *pañcakapālī*. So also is the case of *dviveda*. In the case of the long chain of derivatives under the rule 4.1.90 the identify of forms differs from case to case and hence must be considered as accidental. While *bhāgavitta* means 'the very first number of the chain of derivatives and also the student of *bhāgavittika*, the word *taikāyānīya* refers to the pupil as well as his immediate teacher. A difference of gender is seen in derivatives like *avantī*, *kuntī* and *śūrasenī*, *mādrī* from the names of tribes to which they belong. In other cases the gender of the original word is not retained as in case of *śraviṣṭhaḥ* 'one who is born during *śraviṣṭhā*' or *phalguna*. But in

such cases the resulting word has an adjectival form and can assume different genders. Thus a woman born in phalgunī will have the same form, and a man born in hasta will not show any difference. These changes of gender, thus, have no bearing on the homonymy of the derivative forms. In some cases the number is anomalous, when the town is called varaṇāḥ and pañcālāḥ as the place of the people. Lack of agreement is seen in expressions like sikatā deśaḥ, śarkarā deśaḥ.

Leaving aside these cases, the homonymous derivatives fall into clear semantic groups. We can class them as follows :

- (a) A word refers to a person and also his descendents and his units. The son of gāṅgā is also a gāṅgā. The student of Taikāyaniya is also a Taikāyaniya. The wife of Vataṇḍa and his daughter are both called vataṇḍī. The young one of a caṭakā is also called a caṭakā. A large number of patronimics meaning both the father and the son are put together by Pāṇini in 2.4.58-61.
- (b) A word meaning a tribe may refer to the country inhabited by it, its king or princes or princesses or other descendents. Thus Kamboja and other tribes like Cola, Kerala, Śaka and Yavana may stand for the people as well as their kings. That all these tribes are non-Aryan may or may not have any significance. Pañcālāḥ stands for the people and their country. Avantī, kuntī, kurū, mādri and śūrasenī stand for the princesses of these tribes. The cases in which the identity of form is confined to the plural forms only are dealt with by Pāṇini in 2.4.62-70.
- (c) Words meaning time, particularly the nakṣatras may stand for persons born at that time or events characterised by them. Thus puṣya, kṛttikā may refer to days, śravaṇā and aśvattha may characterise days or nights, phalgunā or tiṣya indicate men born at those times, and also others like rohiṇa, mṛgaśirāḥ etc.
- (d) Words denoting trees and plants may also stand for their fruit, flowers and grain. Thus jambūḥ hārītakī, māṣāḥ, mallikā, kadamba etc. can be used for both.
- (e) Books written by authors and students studying them may

be denoted by the same word. Dviveda, pāṇiniya, aṣṭaka, katha, caraka and others are words of this nature.

- ( f ) Books may be named also after the main characters in it, or prominent words in them. Examples are vāsavadattā, sumanottarā, gardabhāṇḍa etc.
- ( g ) Words meaning measures may stand for the things measured by them. For example vitasti, dvivitasti.
- ( h ) Other types of associations may explain the different meanings of words like varaṇaḥ, śarkarā, gosthānaḥ, ekadhuraḥ, punyāhavācanaḥ etc.

When we set aside such cases, there remain a few which are of some theoretical importance. One such case pertains to words which can be treated as both nouns and adjectives. Thus lavaṇa means salt as well as salty as in lavaṇaḥ sūpaḥ. Pāṇini thinks it necessary to assign them different deep structures and enjoin the loss of the suffix ṭhak. Kātyāyana goes a step further and lays down the rule that after words meaning qualities a matup is to be elided. Thus in śuklaḥ paṭaḥ the word stands for śuklaguṇayuktaḥ paṭaḥ which thus is homonymous with śuklaḥ 'white'.

The other examples illustrate some kind of constructional homonymity and produce the closet approach to a transformational explanation. Both come from the vārttikas of Kātyāyana. In 5.1.71. Pāṇini lays down that the derivative yajñīya from yajña stands for a Brahmin who deserves to perform a sacrifice and the derivative ārtvijīna from ṛtvik stands for one who deserves to have a sacrificial priest. Now Kātyāyana adds a vārttika extending the scope of the suffixes to include the meaning 'tat karma arhati'. This means yajñīya can qualify a deśa in the sense of 'being worthy of having a sacrifice performed in it' and ārtvijīna to qualify a Brahmin 'who can perform the duties of a sacrificial priest' which could not be done under the rule of Pāṇini. In 5.1.74. Pāṇini explains yaujanika to mean 'who can travel a yojana.' Kātyāyana now adds the vārttika to include words like krauśaśatika 'one who can travel a hundred krośas' and yaujanaśatika 'one who can travel hundred yojanas'. Now a second vārttika is added to extend the meaning of these expressions to include the sense of 'abhigamanam arhati'. Thus a bhikṣu or an ācārya can be called krauśaśatika or

yaujanaśatika not because they can travel such distances but because they are so eminent that it is proper for others to come from such long distances to meet them. This naturally gives rise to derivational homonymity. In all these cases, it is clear that Kātyāyana considers the ambiguous expressions to stand for two different expressions which constitute their deep structure. We may paraphrase the words as follows :

Deep structure	Surface structure
( i ) lavaṇasaṁsṛṣṭaḥ sūpaḥ lavaṇaḥ supaḥ	lavaṇaḥ sūpaḥ ,,
( ii ) śuklo guno' syāstīti śuklaḥ paṭaḥ	śuklaḥ paṭaḥ ,,
( iii ) yajñam arhatīti yajñākarma arhatīti	ynjñīyo brāhmaṇaḥ yajñīyo deśaḥ
( iv ) ṛtvijam arhatīti ṛtvikkarma arhatīti	ārtvijīno yajamānaḥ ārtvijīna ṛtvik
( v ) krośaśataṁ gacchatīti krośaśatād abhigamanam arhatīti	krauśaśtikaḥ puruṣaḥ krauśaśatiko bhikṣuḥ
( vii ) yojanaśatam gacchatīti yojanaśatād abhigamanam arhatīti	yaujanaśatikaḥ puruṣaḥ yaujanaśatika ācāryaḥ

While the treatment of the adjectives by Pāṇini can be explained on the ground that for him words like lavaṇa were nouns and not adjectives, for Kātyāyana the identical derivations stand for two distinct basic representations which have to be construed as being transformed into the same surface structure. The situation is quite similar to nominal phrases which LEES collected in his *English Nominalizations* like firing squad and firing pin or a bus driver and a screw driver. The relation between the base word and the derivative suffix is different in the two cases and has to be paraphrased differently.

The large number of cases in which Pāṇini and Kātyāyana enjoin the loss of a suffix also reveal the way in which such situations have arisen. Obviously what is involved is an extension of meaning, a semantic change in case of these derivative words.

In some cases we actually find both the derived form and the base word side by side in the same sense. Such are the facts with śārkarā and śārkarāḥ deśaḥ, abhijit and ābhijātaḥ, rauhiṇaḥ and rohiṇaḥ, ekadhuraḥ and ekadhurīṇaḥ. Once the difference of meaning was admitted, it was quite natural to express it with the appropriate suffixes and then to enjoin their loss. This procedure was based on the theory that the two meanings represent two basically different expressions and the apparent similarity is due to the loss of the differentiating element. Both of them could be mapped on to the same word by the process of delition. With this procedure available, it was easy for Kātyāyana to extend it to cases where the suffix was kept but two distinct expressions with different meanings were mapped on to the same suffix. Whether the difference remains at the semantic level or whether it was clearly formulated as a linguistic structure is a difference of minor importance. Kātyāyana at least has worded them differently and what is important is the fact that the approach is definitely transformational as against some of the attempts of Patañjali who could make use of such purely semantic procedures as lakṣaṇā or try to understand the meaning in a different manner. In fact, Kātyāyana and to some extent Pāṇini did formulate a deep structure as distinct from the surface structure, while Patañjali is more inclined to transform the semantic structure directly into the surface structure in many cases.

# PARAPHRASE AND TRANSFORMATIONS

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The paper attempts to give an account of two stages of Zellig S. Harris' research on Grammar. As the first stage I take the results of his research reported in the paper 'The Elementary Transformations' (1964 : Transformations and Discourse Analysis Papers 54); and for the second stage the findings in 'The Two Systems of Grammar : Report and Paraphrase' (1969 : TDAP 79). Both the papers have appeared in Harris (1970).

In Grammar to-day the efforts are towards finding the source or the basic elements of language and the rules to derive all the other elements of language from the source elements.<sup>1</sup> Harris' efforts are in no way exceptions.

Harris' source elements in 'The Elementary Transformations' are the kernels and certain elements to be added, according to certain (transformational) rules, to an individual or a set of kernels (and of course in most cases to an individual or a set of the derived elements); and the rules which derive from the source or the derived elements some other elements by adding or subtracting something very unsubstantial.

The kernels are supposed to be minimal sentences. The sentences from which if anything is taken out their sentencehood is lost.

They are sentences which form the source of deriving all the other sentences of a language. They consist of sequences of words. The words which themselves are morphemically simple, i.e. single morphemes. They do not contain words such as, *smallish*,

.....  
1. Smaby (1971 : ch. 3) calls such grammars compositional grammars', and argues that natural languages are not describable in terms of such grammars.



*milkman*, which can be derived transformationally. There are different types of kernels. Each type consists of a set of sentences. Following is a set of the types of kernels given for English;

$\Sigma$	t	V	$\Omega_1$	$\Omega_2$	
N	t	V <sub>o</sub>			A man came.
N	t	V <sub>n</sub>	N		The man found gold.
N	t	V <sub>p</sub>	PN		The man relied on gold.
N	t	V <sub>np</sub>	N	PN	The man attributed the letter to Shaw.
N	t	V <sub>nn</sub>	N	N	The man gave Shaw a letter.
N	t	be	N		A whale is a mammal.
N	t	be	PN		The book is on the desk.
N	t	be	A		The box is small.
N	t	be	De		The box is here.
It	t	V <sub>it</sub>			It rained. It's May 8.
There	t	V <sub>th</sub>	N		There's hope.

The kernels have two structures, one superimposed on the other. The structure in terms of subject ( $\Sigma$ ), verb and object ( $\Omega$ ) is needed as the number-agreement depends on such a structure. However most transformational operations are defined and apply in terms of the structure made up of nouns (N), verbs (V), adjectives (A), etc. (P: prepositions, D: adverbs, t: tense morphemes. The subscript indicates the specific subclass, e.g. V<sub>p</sub> is for the class of verbs taking preposition plus noun as their object.) The set of types given is in no way regarded as the final. However, it is obvious that a change in the set will have to be compensated somewhere else in the grammar.

It is evident that the kernels defined in terms of the structures cannot all be converted into real sentences by simple morphophonemic transformations such as *ed come* → *came*. In addition we need insertion of articles: *a*, *the*. Such considerations make kernels abstract structures rather than real sentences.

The kernels are operands on which transformations—transformational operations—operate and transform them into derived sentences. The transformations are defined in terms of the kernels containing certain word categories in  $\Sigma$ , V, or  $\Omega$  positions; or simply in terms of their being sentences. The incremental transformation

such as *Nx know* takes as its operand anything that is a sentence, while the unary transformation passive requires that the operand contains a noun in its  $\Omega$  position and that the verb is other than *be* (and *Vth*, of course). And, of course, the transformations are defined in terms of the changes they bring about giving the derived sentence.

The incremental transformations are of two types. One are called 'inserts'. The other are called 'operators'. In inserts words of certain categories are inserted next to the words of kernels belonging to certain categories or next to the whole kernels. Such insertions do not bring about any additional change in the operands. What is inserted becomes a part of the category of that next to which it is inserted. *a, some* are inserted next to nouns; *simply, just* next to verbs; *quite, very* next to adjectives; *can, may* next to tense; *moreover, in general* next to kernels. The derived *quite competent* behaves as an adjective in *I know a quite competent person* ( ← *I know a person, The person is quite competent* ), that is, *quite* becomes a part of the category of *competent*.

The operators unlike the inserts bring about some additional changes in the operands, and most of them also obtain independent status as  $\Sigma$ ,  $V$ , or  $\Omega$  in the derived sentences (and do not become part of any category next to the member of which they are introduced). The operators are of three kinds :

1. Operators called 'Y' on verbs : *be - ing, have - en*.  
He studies eclipses → He is studying eclipses.
2. Operators called 'U' on the sequence  $V\Omega$  : *be, make, begin*, etc.  
→ He is a student of eclipses.  
→ He makes studies of eclipses.
3. Operators called 'W' on whole kernels : *Nx know, surprise Nx, be Ay*, etc.  
→ I know that he studies eclipses.  
→ His studying eclipses surprised me.  
→ That he studies eclipses is clear.

The changes — the deformations — effected on the operand are evident. In the resulting sentences the elements of  $U$  and  $W$  obtain independent status of  $V$ ,  $\Sigma V$ , or  $V\Omega$ ; and the elements

of the operand obtain different status than what they had in the operand. What was  $V$  in the operand becomes a part of  $\Omega$  in the result of applying  $U$ . In the results of  $W$  the whole kernel becomes either  $\Omega$  or  $\Sigma$ .

Then there are transformations called unaries which transform a single sentence into a different single sentence. They are 'Passive', 'Middle', 'Extraction', etc.

→ Eclipses are studied by him  
(Passive).

I attach this interpretation to your words →

This interpretation attaches to your  
words (Middle).

Then there are binary - connective - transformations. They operate on two sentences, connecting them and inserting a connective, *because*, *and*, *wh-*, etc., at an appropriate place, or deforming one of the sentences.

He waited, He hoped they would come.

→ He waited because he hoped they  
would come.

→ He waited hoping they would come.

There are, further, zeroing transformations which delete recoverable material from, mainly, derived sentences.

He is hit by Nix → He is hit.

Except for certain binaries, as in *He came and I left*, all the transformations produce sentences which have structures same as those for kernels, in terms of  $N$ ,  $V$ , etc. (though the operands and the resultants may have different kernel structures). This is important as the transformations which are defined on kernel sentences also can apply to the derived sentences, e.g. *He is hit* → *He has been hit* (result of *have - en*, a  $Y$  operator, on  $V$ ).

An interesting topic discussed in the paper under consideration is that of analogical extensions. The established transformations are extended to the domain similar (not identical, of course) to their own domains. One purpose for such extensions is to explain away the unary transformations, however a more important purpose is to recognize linguistic creativity.

A transformation  $x$  relates two sentences  $a$ ,  $b$  because they have specific forms, or contain a particular grammatical category. A sentence  $c$  similar to one of the two sentences  $a$ ,  $b$  may become a domain of the transformation  $x$  and thus be transformed into a sentence  $d$ . The sentences of the type  $d$  will be somewhat peculiar. The degree of peculiarity will depend upon how much the sentences of the type  $c$  are similar to the sentences of one of the types  $a$ ,  $b$ . A simple example would be

He comes generally  $\longrightarrow$  Generally he comes.  
 He walks slowly

---

Slowly he walks.

*generally* being an insert on kernel is free to be moved to the first position, but *slowly* a right insert on verb is not as free.

Inverse transformations are interesting types of analogical extensions. Two sentences  $n$  and  $p$  are similar. Of the elements in which  $n$  and  $p$  are similar the element in  $n$  is the effect of a transformation  $y$  on a sentence  $m$ , while the element in  $p$  is basic and not an effect of  $y$ , say, on a non-existing sentence  $o$ . From such a  $p$  we may subtract the element that is similar to the effect of  $y$  in  $n$  - as though we were undoing the effect of  $y$  in  $p$  - and derive a sentence  $o$ . An example would be

chokro rəḍe che  $\longrightarrow$  chokrane rəḍwū awe che.  
 boy cry is to boy crying come  
 chokrane taw awe che.  
 fever

---

chokrane taw che.<sup>2</sup>

For Harris transformational relations hold between sentences which have among other things the same degree of acceptability. That is, one of the criteria for anything to be a transformation is whether it preserves acceptability. All the transformations sketched above (except for extensions, of course) preserve acceptability. However one may ask whether they also preserve meaning, that is,

2. This will be an alternate solution to the one given by KACHRU (1970) for the sentences such as *ləḍkeko bukhar he*, *ləḍkeko pəta he*, although *mere do ākhe he* will be of different type.

whether they are paraphrastic. In the above transformations certain U operators (*be, do, make*) and the unaries are the only transformations which preserve meaning. For the other transformations if we separate the additions (in the case of certain binaries, also the application conditions) from the subsequent changes (such as, introduction of nominalizing suffix, introduction of *that*, etc.) the latter turn out to be paraphrastic transformations. In this approach the U operators *be, do, make* will be on par with the nominalizing suffixes, that is, they will turn out to be the constants of (the changes introduced by) the paraphrastic transformations. Harris achieves such a division of transformations in his next paper 'Report and Paraphrase' under consideration, although the division is a side product of certain other considerations.

In the paper 'Report and Paraphrase' Harris points out restrictions and irregularities in the type of system proposed in 'The Elementary Transformations'. To improve upon that system he appeals to the concepts of 'free variant', 'less-restrictedness', neutralization, etc. Following is a sketch of his efforts in 'Report and Paraphrase'.

Unlike most adverbs of degrees the insert *very* is restricted to adjectives; it does not go on verbs. A free variant (possessing the same meaning) of *very* however is not similarly restricted. *to a great extent* is that free variant, and goes on adjectives as well as verbs. On a verb, for example, in *The room darkened to a great extent*.

*be - ing*, a Y operator on verbs, does not accept *know, own*, etc. as its operands, e.g., \**I am knowing English*. However *be in process*, a free variant of it, is not restricted in the same sense. Although *My knowing of English is in process* is still strange, the strangeness is evident from the sentence itself — knowing is not a process (as we know it so far), and, unlike in the case of *be - ing*, we do not have to appeal to the classes of verbs on which *be in process* can or cannot go.

The sentences under the W operators of the type *Nx request* are restricted to the subjunctive form. By having a free variant *Nx request-for-afterwards* (which actually has the built in restriction) the restriction becomes obvious. The tense of the operand of such a revised operator is automatically decided with respect to

the tense of its operator and need not be specified, hence we have the operand in subjunctive.

Tense in some cases is dependent on time adverbs like *yesterday*, *tomorrow*, while in other cases it is independent, e.g., in *He left*. Accepting an overt time adverb in all the latter type of cases make tense entirely a dependent category. (We might even say that the time adverbs are pluri-morph and discontinuous morphemes with *-s*, *-ed*, *will*, etc. being their parts.) Such time adverbs will be *before now* or *in the past*, *after now* or *in the future*, etc., in e.g. *He left before now / in the past*.

Because of the revision, inserts, Y operators and even tenses have the form of sentence (W) operators.<sup>3</sup> A most common change or deformation of sentences under these operators is the sentence nominalization, e.g., *his leaving*. Then, all (actual) sentences can be said to have as a source a nominalized sentence with at least a tense operator on it.<sup>4</sup> An alternative source can be an operator as a predicate having a sentence as its argument. Such argument sentences can themselves be viewed as verbs, adjectives or adverbs predicated to nouns. Then the sources will appear somewhat like the following.<sup>5</sup>

to a great extent (darken (room)).  
 in process (know (I, English)).  
 request-for-afterwards (I, go (he)).  
 in the past (leave (he)).

The efforts to find less restricted and more regular (or simply more transparent) source forms for connectives show that they are predicates on two nouns or two sentences. *wh-*, *and* and *or* are different from the rest of the connectives in that they do not connect two operands by taking an automatic *be* on themselves, e.g.,

\*His coming is and my coming.

while

His coming is before my coming.

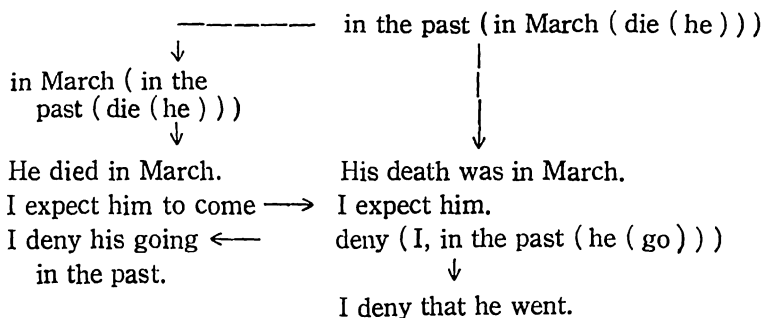
His coming is because of my coming.

.....  
 3. Note that tense is no more a primitive category.

4. Although there will be no sense in putting a tense operator in the source for the sentences in subjunctive.

5. In logic the form is called 'propositional form' by some. Harris, here, calls the form 'operator-notation'.

Transformations in the source thus revised are predications or the incremental transformations, and although they preserve acceptability, they change the meaning. To derive actual sentences from such a source paraphrastic (or morphophonemic) transformations will be needed. As against the incremental transformations the paraphrastic ones will be restricted in their application, e.g., *to a great extent* → *very* will apply only if *to a great extent* has as its argument and adjective. The paraphrastic transformations in addition to preserving acceptability also preserve meaning. Although Harris does not talk of deriving one source sentence from another by a paraphrastic transformation, that is, there are no paraphrastic relations among source sentences, for some paraphrastic transformations one possibly can say otherwise. The paraphrastic transformations are made up of the standard operations like permutation, zeroing, addition and substitution. The following are some derivations showing the application of these transformations.



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# CAUSATIVE SENTENCES IN INDIAN LANGUAGES

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1.0 In a number of recent linguistic publications various suggestions have been put forward to account for the causative constructions in languages such as English, Hindi, Tamil, Kolokuma etc. Since causative constructions seem to be universal, it is obvious that a well-motivated description of these will constitute a valuable contribution towards the formulation of a linguistic theory. The purpose of my paper is to suggest a particular account of causative sentences in one Indian language, Hindi, with the hope that this could be generalized for most Indian languages. The account I suggest is well-motivated in so far it seems to account for the data from Telugu and other languages mentioned by Krishnamurti ( 1971 ).

1.1 The causative sentences in Hindi have been discussed in a number of recent linguistic works and some very interesting facts have come to light as a result of these.<sup>1</sup> Most descriptions agree that causative sentences involve the process of embedding, but in one of the works, it has been claimed that '..... causative sentences in Hindi do not have embeddings and have the structure of a simplex sentence' ( Balachandran *op. cit.* 64 ). Since some very powerful arguments have been given to support various claims made in the works mentioned above, it may not be entirely useless to reexamine the whole topic of causative sentences in Hindi and see what could be an explanatory account of the phenomenon so widely discussed. Also, the causative sentences in Hindi are of theoretical interest in so far as they support a particular hypothesis about the nature of lexical insertions in a transformational grammar: they provide evidence for McCawley's claim that ' ..... the complex of semantic material

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1. Note among others, the following : Bahl 1967, Balchandran 1970, Kachru 1965, 1966, Sinha 1970, and Sah 1971.



which a lexical item corresponds to need not be a constituent of the semantic representation per se, but may be a constituent which arises through a transformation.....' ( McCawley 1968 : 72 ). The causative sentences in Hindi, however, question McCawley's suggestion with regard to '..... requiring all lexical insertions to take place after the cycle but before the postcyclic rules' as a ' way of constraining lexical insertions so that their ordering would not be a way in which languages could differ '. ( Mc Cawley 1968 : 78 ). In this respect, it is interesting to compare the properties of the causative sentences with those of the *ko*-sentences in Hindi.<sup>2</sup> By *ko*-sentences, I mean sentences such as the following :

1. ram ko bhūkh ləgī  
'Ram' 'to' 'hunger' 'felt'  
Ram felt hungry.
2. mujhko ləgta hε ki bariš hogī  
'me' 'to' 'feels' 'that' 'rain' 'will happen'  
It seems to me that it will rain.

Notice that in these sentences, the logical subjects ( ' Ram ' and ' I ' respectively ) appear with a dative postposition ( *ko* ), and the complements ( ' hunger ' and ' that S ' respectively ) function as grammatical subjects. I shall discuss the nature of *ko*-sentences as it relates to the hypothesis of lexical insertion towards the end of this paper.

1.2 Three of the works mentioned above list verbal subclasses relevant to a discussion of causativization in Hindi ( Bahl 1967, Kachru 1966, Balchandran 1970 ). I shall not summarize their findings here. The questions which are most interesting to review are the following : ( i ) do the causative sentences involve embeddings, and if so, is the causative rule a postlexical transformational rule?<sup>3</sup> ( ii ) which grammaticosemantic features of verbs are relevant for causativization and for case assignment to the various Noun Phrases that occur in a causative sentence? These will be taken up in the following discussion.

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2. For a detailed discussion of some aspects of the syntax of *ko*-sentences in Hindi, see Kachru 1970.
  3. I shall use the term postlexical rule to designate any transformational rule that operates on a P-marker after lexical insertions have taken place.

2.0 The main arguments that Balchandran presents in support of her claim that causative sentences do not have embeddings are the following : first, the noncausal verb can occur with a number of manner adverbials, but when embedded under a causative node, the noncausative or innermost verb can not be modified by such adverbials, e. g. , *munna rote - rote so gəya* 'The child fell asleep crying' is a good sentence of Hindi, but in *jījī ne munne ko rote-rote sulaya* 'The elder sister put the child to sleep crying' the adverbial *rote - rote* refers back to *jījī* and not to *munna*. There is no natural way the grammer could impose a restriction that embedded verbs under causative could not be modified by manner adverbials. Second, some restrictions have to be specified with regard to the occurrence of reflexive pronouns in causative sentences, e. g. , in *ram ne əpne kəp̄re p̄əhne* 'Ram wore his clothes' the reflexive pronoun *əpna* refers back to Ram, but in *mohən ne ram ko əpne kəp̄re p̄əhnae* 'Mohan caused Ram to wear his clothes', the reflexive pronoun *əpna* unambiguously refers back to Mohan and not to Ram. Since both reflexive and causative rules are cyclic, it would be impossible to constrain the reflexive rule in a way that would ensure its application only after the causative rule. Third, semantically, it is not true that the causative sentence implies the noncausative sentence, e. g. the following sentence is grammatical *mā ne baccə ko sulaya p̄ər vāh nāhī soya* 'Mother put the child to sleep but he didn't sleep' although the negative sentence with the noncausal verb denies what the positive sentence with the causal verb asserts. Finally, the deep structure case marking of Agent or Experiencer remains the same in the causative sentences also, so that although *mē ne ləṛke ko d̄əṛaya* 'I made the boy run' is a grammatical causative sentence and *ləṛka* in this sentence is superficially marked as object ( with the objective marker *ko* ) the adjectivization rule does not apply to this sentence and yield a phrase *\*mera d̄əṛaya hua ləṛka* 'the boy made to run by me' because *ləṛka* retains its Agent function in the causative sentence, too.

I argue below that the first argument presented by Balchandran is only partially correct, the third is wrong, and there are well-argued answers for the second and the fourth ( cf. 3.0 and 2.3 respectively ).

2.1 It is not correct that the manner adverbials that occur in the innermost sentences could not occur with the same reference in

the complex (causative) sentences. Consider the following sentences :

3. *nərs ne rogī ko leṭe – leṭe dəva pila dī* ‘The nurse caused the patient to drink the medicine lying.’
4. *mē in bədtəmīz ləṛkō ko khəre – khəre nikəlve dunga* ‘I shall have these ill-mannered boys thrown out (while  

{	I am	}
{	they are	}

still) standing.’
5. *pulis ne gaṛī ko cəlte – cəlte rukva liya* ‘The police made the vehicle stop (while) moving.’
6. *mā ne nəkər se savdhanī se bistəre ləgvae* ‘Mother made the servant make the beds carefully.’

Notice that sentences 3-6 are ambiguous. The adverbials *leṭe – leṭe*, *khəre – khəre*, *cəlte – cəlte*, and *savdhanī se* do not refer back unambiguously either to *nərs*, *mē*, *pulis* and *mā* or to *rogī*, *ləṛke*, *gaṛī* and *nəkər* respectively. For at least some speakers of Hindi, an unambiguous reference will be signalled by a change of order in the surface-structure, e. g. :

7. *mā ne leṭe – leṭe ram ko kəhanī sunāi* ‘Mother told Ram a story lying.’
8. *sikṣək ne khəre – keṛe ṣərarəti ləṛke ko nikəlva diya* ‘The teacher had the mischievous boy thrown out (while) standing.’
9. *pulis ne cəlte – cəlte gaṛī rukva lī* ‘The police made the vehicle stop (while) leaving.’

The above seems to be true of all manner adverbials derived from intransitive verbs; the only exceptions seem to be verbs of expression such as *hāsna*, *rona*, etc. It may be the case that verbs such as *hāsna*, *rona* etc. are verbs of volition just as the majority of transitive verbs in Hindi are and therefore there is a ‘preference’ to interpret adverbials derived from these verbs as referring to that Agent of the sentence who ‘controls’ the action, event or process rather than the Agent who merely performs the action, or experiences

the experience, or is affected by the event.<sup>4</sup> This is not an entirely unmotivated suggestion, but, other considerations point to a more acceptable solution of the problem which is briefly discussed in 3.2.

2.2 Balchandran's argument that sentences such as 10 are well formed is incorrect :

10. \**mā* ne bæcce ko khilaya, phir bhī usne nēhī khaya  
\* 'The mother made the child eat but he did not eat.'

Notice that the English sentence is ungrammatical as the adverbial conjunction conjoining a negation of what is asserted by the first conjunct produces a contradiction. In general, a causative, especially with a perfective, implies the completion of the *action / process / event* instigated, hence, all the following sentences are ungrammatical :

11. \**mē*ne panī ubala, pər panī nēhī ubla  
'I boiled the water, but it didn't boil'.  
12. \**nəkər* ne bæcce ko kəpṛe pəhnae, phir bhī usne nēhī pəhne  
\* 'The servant dressed the child but the child didn't get dressed.'  
13. \**ram* ne mohən se upənyas xərīdvaya, pər mohən ne nēhī xərīda.  
\* 'Ram made Mohan buy a novel but he didn't buy (it).'

A higher performative verb, however, will result in grammatical sentences :

14. *mē* ne panī ubalne kī košīš kī, pər panī nēhī ubla  
'I tried to boil the water but it didn't boil.'  
15. *ram* ne mohən se upənyas xərīdvane ka prəyətṇ kiya pər mohən ne nēhī xərīda

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4. Krishnamurti 1971. The distinction Krishnamurti makes between the Performer/Experiencer agent and the agent who 'controls' the action, process, or event is important. Notice, however, that the specific arguments he presents against Balchandran's argument can not be justified. There is no natural way to block *jījī ne munne ko rote - rote sulaya* 'The elder sister put up the child to sleep while he was crying' if causative sentences are accounted for by a postlexical causative transformation. It is interesting that Krishnamurti suggests that the embedding of *rote - rote* in the above sentences in its usual meaning follows the lexicilization of *sona* and *caus.* to *sulana*.

' Ram tried to make Mohan buy a novel, but Mohan did not buy it. '

2.3 The implication of the reflexive rule will be discussed after a reply to Balchandran's fourth argument is outlined. It is not correct that \**mera dṛāya hua ləṛka* is ungrammatical only because of the deep structure case ( Agent, in this instance ) of *ləṛka*. In the following examples, all noun phrases that contain a past participial modifier modifying an animate noun are ungrammatical :

16. *mēne ləṛke ko pukara*  
' I called the boy. '
- 16a. \**ləṛka mera pukara hua he*  
16b. \**mera pukara hua ləṛka*
17. *mēne kutte ko səhlaya*  
' I patted the dog. '
- 17a. \**kutta mera səhlaya hua he*  
17b. \**mera səhlaya hua kutta*
18. *pulis ne cor ko pəkṛa*  
' The police arrested the thief. '
- 18a. \**cor pulis ka pəkṛa hua he*  
18b. \**pulis ka pəkṛa hua cor*

5. Both Kleiman 1971 and Krishnamurti 1971 suggest that such sentences in nonperfective tenses are grammatical. This, however, is not quite true. The following, although in imperfective, is still ungrammatical :

- a. \**mē dhobī se kəpṛe dhulvata hū, vəh nəhī dhota*  
\* ' I get (my) clothes washed by the dhobi, but he does not wash them. '

Sentences such as the following require special interpretation :

- b. *mā rotiyē bənatī hū, pəṛ ve bəntī nəhī*  
' I make Rotis, but they do not get made well. '

Notice the ordering of noncausal form of the verb with respect to the negative particle *nəhī*. In durative and future, such sentences are grammatical, as they involve action in progress and prediction respectively.

- c. *mē bəcce ko sula rəha hū, pəṛ vəh so nəhī rəha he.*  
' I am putting the child to sleep but he is not asleep yet. '

6. cf. Krishnamurti, *op. cit.* 27, 'The intended reading depends on the choice of other elements like the tense and aspect, quantifiers, punctual and durative adverbs, performatives, etc. and the pre-suppositions that flow from them. '

Notice that all the verbs above, i. e., *pukarna*, *sahlana*, *phakarna* are inherently transitive, hence, the deep structure case of the nouns *larika*, *kutta* and *cor* are not responsible for the ungrammaticality of 16–18.<sup>7</sup> The adjectivization rule of Hindi is constrained in such a way that transitive verbs with animate objects do not yield past participial modifiers that modify the animate object.<sup>8</sup>

2.4 It is clear from the foregoing discussion that the arguments presented to support the claim that causative sentences do not involve embedding are not overwhelmingly convincing. Even Balchandran notices the regularity with which the 'Non-Causative, Direct Causative and Indirect Causative stems of the verbs are related' to each other (Balchandran *op. cit.* 90). She also argues against listing the three stems of a verb separately in the lexicon and proposes 'we can enter for each verb an underlying stem from which the variant stems can be derived by some general morphophonemic rules... For each verb we can specify the *Basic Case Frame* in the lexicon. The Basic

7. According to Balchandran, *pukarna* basically has the case-frame A + D (*op. cit.* 103); hence *larika* in 16 is marked Dative.

8. Both Kachru (1965 and 1966) and Verma (1966) fail to mention this in their discussion of the adjectivization rule in Hindi. Notice that there are some cases where a past participial modifier cooccurs with an animate noun, e.g. :

(i) *ghar se bhagaī hui ratē*  
'The women made to run away from home.'

(ii) *mā ki dekhī hui larikiyā*  
'The girls seen by mother.'

In some sense, both *bhagana* (causative of *bhagna*) and *dekhna* (transitive V) have 'special' meanings in the above phrases. *bhagana* has an extended meaning 'to elope with' and *dekhna* has an extended meaning 'to interview a boy/girl to determine his/her suitability for a matrimonial alliance.' In addition, the objects of *bhagana* and *dekhna* (in such special senses) are indefinite, and though animate, are not followed by the postposition *ko*. This may indicate a [—animate] feature assignment to nouns such as *ratē*, *larika*, *lariki* *bacca*, etc. in the context of some verbs. Notice that (b) would be preferable to (a) where *lariki* is marked

{ + definite }  
{ + animate }

(a) ? *mē ne ram kī larikī dekhī*

(b) *mē ne ram kī larikī ko dekha*

'I saw Ram's daughter.'

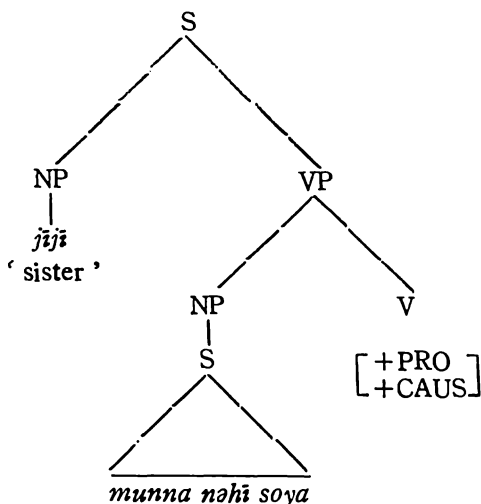
Case Frame is the array of cases in which the verb in question appears when it is Non-Causative... The case-frame that is required for a verb when it gets marked for Causative features can be derived from the basic case frame by way of some general Redundancy Rules' ( Balchandran *op. cit.* 93 ).

3.0 A grammatical description of the process of causativization in Hindi has to account for the following facts. The noncausative and causative sentences are related, both, syntactically and semantically, in regular ways. The most satisfactory account of this regularity is achieved if we propose that the causative rule is a recursive rule and that causative sentences involve embedding. The fact that the causative rule does not interact with rules such as reflexivization and adverbialization suggests that causative rule is not a post-lexical transformational rule. If it were a postlexical transformational rule which was cyclic, it would have to interact with reflexivization and adverbialization rules, but such interaction produces ungrammatical sentences in Hindi. The only reasonable explanation, then, is that the causativization rule is a prelexical transformational rule, as Kleiman has suggested.<sup>9</sup> If we accept her suggestion, all the above and some additional facts get a natural explanation. The fact that in *ram ne mohān ko apne kapre pahnae*, the reflexive *apna* does not refer to *mohān* is explained in the following way. The underlying representation of the sentence, roughly, is: [ X [ Y [ WEAR [ Z'S clothes] CAUSE ] ]. The semantic material ( X ( Y ( WEAR ) ) CAUSE ) is incorporated by a causativization rule and thus, the agent of ( WEAR ( CAUSE ) ) now is X. In case X and Z are identical, reflexivization takes place, otherwise it is blocked. The additional facts that get an explanation are as follows.

3.1. Notice that the innermost sentence of a causative sentence in Hindi can not be negative. That is, the following underlying structure does not result in a grammatical causative sentence in Hindi.<sup>10</sup>

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9. Kleiman 1971. I shall not go into the details of her proposal here; I shall, however, build my arguments on the basis of her proposal.
10. Sinha claims that the causative sentence in Hindi is an instance of NP-Complementation (*op. cit.* 32). If it were so, the structure A should yield a grammatical causative sentence in Hindi. But,

A



If it is accepted that the causative rule is a prelexical rule and that the lexical verb *sulana* substitutes the underlying semantic material ( X ( Y ( SLEEP ) ) CAUSE ), it is obvious why A does not yield a grammatical sentence; there is no lexical verb in Hindi to replace ( X ( Y NOT SLEEP ) CAUSE ).

it does not. Notice that in other cases involving NP-Complementation, the embedded S may be negative, as in *mē ne ram ko vāhā nā jane ko kaha* 'I told Ram not to go there.' Sinha views the causative construction as involving two rules, a zero-complementizer rule which is sensitive to the features [ + causative one ] or [ + causative two ] of Verb, and the causative rule which is sensitive to these features and replaces them with *-a* and *-va* respectively. The incorporation of V *-a -va* is achieved by a morphophonemic rule. (Sinha, *op. cit.* 32-36). The zero-complementizer transformation accomplishes the following: it attaches a zero to the embedded S to the left of all its constituents and deletes its Aux. It is hard to see what motivates the zero-complementizer transformation. All the instances for which a zero-complementizer transformation has been proposed could be accounted for by the subject-raising rule. (Sinha's *ye*-replacement). Other rules such as the imperfective participle rule (Sinha p. 119) could accomplish the task of replacing one exponent of Aux. with another, under his framework, without much complication. The causative rule as proposed by Sinha is of trivial nature and offers no explanation of the syntactic facts discussed in this paper.



3.2. Consider the following sentences :

19. *bacca khana kha kər soya.*

'Having eaten, the child went to sleep.'

20. *mā ne bacce ko khana kha kər sulaya.*

a. 'Having eaten, the mother put the child to sleep.'

b. \*'The child having eaten, the mother put him to sleep.'

Notice that 20 is not ambiguous, *khana kha kər* in this sentence refers only to mother, and not to the child as in 19. If the causative rule were a postlexical rule, 20 should have been ambiguous, i.e., it should have been grammatical in the interpretation 20b as well. But, it is not. This again supports the proposal that the causative rule is a prelexical rule. The *V-kər* phrases in Hindi are probably derived from an embedded sentence, the embedding takes place only if the subjects of both the matrix and the embedded *S-Verbs* are identical.<sup>11</sup> Sentence 20 could not be interpreted as 20b, i.e., in a way which would identify the subject of *kha* as being *bacca*, because in that case, the hypothetical underlying representation, leaving irrelevant details out, would be as follows:

$$\begin{array}{cccccccc} [X & [Y & [ & [ & [Y & kha] & ] & SLEEP] & ] & CAUSE] \\ S_0 & S_1 & VP & Adv & S_2 & & S_2 & Adv & S_1VP & S_0 \end{array}$$

The prelexical causative rule will apply to (X (Y SLEEP) CAUSE). Subsequently, the adverbialization rule that yields *V-kər* phrases could only apply if the subject of *kha* is identical to the subject of the causative verb. In this case, the identity condition is not met, hence, the rule is blocked. On the other hand, 20 is grammatical in the interpretation 20a, because the underlying representation of the sentence, roughly, is as follows:<sup>12</sup>

$$\begin{array}{cccccccc} [X & [ & [X & kha] & ] & [ & [Y & SLEEP] & ] & CAUSE] \\ S_0 & Adv & S_1 & & S_1 & Adv & NP & S_2 & S_2 & NP & S_0 \end{array}$$

11. This is true of all sentences that contain a *V-kər* phrase. The only exceptions are expressions such as *car bəj kər dəs minət hue hē* 'It is ten minutes past four.'

12. Whether the adverbial precedes the object or the object precedes the adverbial is not crucial to this discussion. The following is a paraphrase of 20 in the interpretation of 20a :

a. *mā ne khana kha kər bacce ko sulaya.*

The prelexical rule of causativization applies to ( X ( Y SLEEP ) CAUSE ). Next, the adverbialization rule that yields V-*kār* phrases applies as the subjects of the causative verb and the verb *kha* are identical.<sup>13</sup>

4.0 The process of causative embedding thus involves the following rules: a prelexical causativization transformation that via predicate raising creates a constituent of the type (X(Y(Z VB) CAUSE) CAUSE) where X, Y and Z are participants and VB is the noncausative form of any V which is marked [ +causative ], a subject raising rule that raises the NP corresponding to Y and in subsequent cycle, the NP corresponding to Y to the next higher S and case marking rules which assign proper case markings to NP's corresponding to X, Y and Z.<sup>14</sup>

- .....
13. The counter-examples I have cited earlier to point out that Balchandran is not absolutely correct ( sentences 3-6 in this paper ) raise some interesting questions. Notice that the embedding of V-*ta hua* and V -*a hua* and also of the reduplicated present and past participials as adverbials does not depend upon subject identity. In this respect, the participials behave differently as compared with the V-*kār* phrases. As a consequence, at least for some speakers of Hindi, *jīñ ne munne ko rote-rote sulaya* is ambiguous. For those who do not have two interpretations of this sentence, probably the the verbs of expression such as *hāsna, rona* etc. are marked for subject-identity for the purposes of the rules that yield participial adverbials. Verbs such as *hāsna, rona*, etc. are different from other intransitive verbs in various ways. Note that whereas there is a semantic distinction between *cāl kār* and *cālte hue, leñ kār* and *rote hue* ( also *hēs kār* and *hēste hue* ) are usually interpreted identically, i.e., as manner adverbials only.
14. It is not clear if an optional rule of 'agent creation' is needed to account for the causative sentences in Hindi ( cf. J. Geis's proposal for English on the basis of data such as the following : *John liquified the parafin by heating it.* Her proposal is that the subject of the inchoative verb is the sentence *John heated the parafin*, after the operation of the 'agent creation' rule, the rest of the embedded sentence is extraposed as a *by*-phrase and *John* becomes the subject of the causative sentence). Kleiman ( 1971 ) suggests that this is plausible for Hindi on the basis of data such as the following :
- (a) ram ke ag jālne se panī ubla  
'the water boiled because of Ram's lighting the fire.'
- (b) ram ne ag jāla kār panī ubala  
'Ram boiled the water by lighting the fire.'

Note that the prelexical rule of causativization in Hindi is obligatory, i.e., there are no grammatical paraphrases of causative sentences which keep the constituents of the semantic complex distinct on the surface. To ensure that an underlying representation such as (X(Y(Z VB) CAUSE) CAUSE) ends up in a grammatical sentence, the rule of causativization must apply recursively and a single lexical item, viz., the causative form of VB, must replace the resulting complex of semantic material. Notice also that the lexical insertion of the causative verb must precede the application of such cyclic rules as reflexivization, adjectivization, adverbialization, etc. Another topic in Hindi syntax provides evidence to support such a claim, namely, that lexical insertion of verbs must precede postlexical cyclic rules in Hindi. The topic is that of *ko-* sentences in Hindi mentioned in 1.0. But before I discuss the evidence provided by *ko-* sentences, I would like to discuss in some detail the subtopic relating to the case marking of the NP's in causative sentences in Hindi. Some of the properties of verbs that play a crucial role in case marking but have not been discussed clearly are the following.

4.1 In my earlier work, I had posited two grammaticosemantic features, [ātmane] and [parasmai], to account for certain properties of compound verbs in Hindi (these will be referred to as [ $\pm$ atmāne])

It is true that every causative sentence may contain a *V-kār* phrase which semantically states the cause that results in the effect described by the causative verb. It is also true that for every causative sentence such as (b), there is a paraphrase sentence such as (a) which is noncausative and which contains a NP *-se* phrase such that the NP is a nominalization of the S underlying the VP *-kār* of the (b) sentence. The relationship of NP *-se* and noncausative V in the (a) sentence is identical to the relationship of V *-kār* and causative V of the (b) sentence. This, causative verb is an embedded S. Notice that even noncausative verbs in Hindi may cooccur with similar *V-kār* phrases :

(c) *mē ne əxbar pəṛh kār jana ki ram cunav mē jīt gəya*  
 'I gained the information that Ram won the election by reading the newspaper.'

*janna* 'to know' is an inherently transitive verb in Hindi and it can not be causativized. It may be the case that *janna* itself is composed of complex semantic material and is inserted after the causativization rule has applied. I am, however, aware of no syntactic evidence to support such a claim at present. This question is still open for further research.

in the following discussion). I had also pointed out that transitive verbs which are marked [ +atməne ] and thus occur only with the operator *lena* have a first causal form which normally occurs with the operator *dena* ( the operator *dena* does not occur with [ +atməne ] ) and, furthermore, that only those verbs which occur with *dena* have a ( 2nd ) causal form. Note that all first causal ( transitive ) verbs derived from intransitive verbs share this property, i.e., they occur with *dena* and have a ( 2nd ) causal form. The first causal forms of verbs are thus automatically [ -atməne ]<sup>16</sup>. The subjects of all verbs that are marked [ -atməne ] are, after the causative embedding, assigned the role of mediary agent and marked with the postposition *se*.<sup>16</sup> The animate subjects of [ +atməne ] transitive verbs, however, are assigned the role of the recipient in the first causal ( double transitive ) and are marked with the dative postposition *ko*. The subjects of intransitive verbs function as direct objects of causative sentences, and if animate are marked with the objective postposition *ko*. The subject of the highest verb is assigned the role of agent and is marked with the agentive postposition *ne* under appropriate contexts. The fact that only the subjects of [ +atməne ] transitive verbs could function as recipients in causative sentences is interesting. Note that the subject of a [ +atməne ] verb combines the roles of agent and beneficiary both, hence, [ +atməne ] verbs do not take a benefactive adverbial.<sup>17</sup> The indifferently marked verbs e. those marked [ ±atməne ], may take a benefactive adverbial, as

15. This is not to deny that the first causal forms occur with *lena*. All I am claiming is that normally, the noncausative V + *lena* turns up as V + *dena* in the first causal, e.g. *ram ne əngrezi sikh di. me ne ram ko əngrezi sikha di*. Most transitive verbs are marked, indifferently, as [ ±atməne ] e. g. *bəna lena, bəna dena, dho lena, dho dena* etc.
16. Sinha wrongly claims that the subject of first causal is marked as dative in the second causal ( *op. cit.* 35 )
17. Verbs such as *khana, pīna, iskhna, pəjhna, janna, pəhəanna, ojhna, kəmana, pana, socna, səm əjhna*, etc. are marked [ +atm əne ]. *janna, pana, kəmana, soona* are marked [ -causative ]. Others, in their causal form are marked [ -atməne ], and cooccur with *dena*. Notice that *pəjhna* and *likhna* require two dictionary entries each, one marked [ +atməne ] and the other both [ ±atməne ] The evidence

the subjects of these verbs do not combine the roles of agent and beneficiary. The subjects of these verbs assume the role of mediary agent in causative sentences as the subject of the higher verb is assigned the role of the controlling agent. The postpositions *ko* and *se* assigned to subjects of [+atm $\bar{a}$ ne] or [ $\pm$ atm $\bar{a}$ ne] verbs in causative sentences thus signal an important semantic distinction.

4.2. My claim about causative sentences in Hindi can be summed up as follows. Causativization in Hindi is the result of the application of a prelexical causative rule which is obligatory. There is only one abstract predicate CAUSATIVE in Hindi which has, among others, the grammaticosemantic feature [-atm $\bar{a}$ ne]. There is no need to posit a CAUSATIVE II predicate to account for the assignment of *se* to the mediary agent in causative sentences, as Sah does. The assignment of *se* depends entirely on the features of the innermost verb.<sup>18</sup>

4.3. Notice that the case assignment rules that assign the objective *ko*, the dative *ko* and the instrumental *se* are all relevant for other areas of Hindi grammars also. The rule of subject raising is also independently motivated to account for certain constructions

for this is in the following sentences :

- (i) ram ne ciṭṭhī pəṛhli  
'Ram read the letter (for himself).'
- (ii) ram ne ciṭṭhī pəṛh dī  
'Ram read the letter out loud.'
- (iii) vm $\bar{e}$  ne ram ko ciṭṭhī pəṛhāi
- (iv) m $\bar{e}$  ne ram se ciṭṭhī pəḥavī  
'I made Ram read the letter.'
- (v) ram ne mujhse hindi pəṛhī (\*pəṛh dī)  
'Ram learnt Hindi from me.'
- (vi) m $\bar{e}$  ne ram ko hindi pəṛha dī  
'I taught Ram Hindi.'

Note that *pəṛh* [atm $\bar{a}$ ne] is equivalent to English 'read' and *pəṛh* [atm $\bar{a}$ ne] is equivalent to English 'to learn, to study.'

18. I have not considered Sah's suggestions with regard to the description of causative sentences in detail here. Some aspects of his suggested treatment are discussed more thoroughly in my forthcoming paper (Kachru 1972). The explanatory power of features [ $\pm$ atm $\bar{a}$ ne] is discussed in detail in the same paper.

discussed under NP – Complementation.<sup>19</sup> The rule that crucially distinguishes the causative sentences from other complex sentences then is the prelexical rule of causativization which involves predicate raising. The rule operates on semantic material and creates a constituent which is later replaced by a lexical item.<sup>20</sup>

5.0. The *ko*-sentences of Hindi support the claim that the lexical insertion of the verb precedes at least some of the (post-

19. Independent of causative sentences, the objects of inherently transitive verbs may occur with the objective postposition *ko*. All animate objects of transitive verbs (*pukarna* 'to call', *bulana* 'to invite', etc.) and all inanimate objects marked [ + definite ] take the marker *ko*. The same rule will assign *ko* to subjects of intransitive verbs as it is sensitive to features such as [ + animate ], [ definite ], etc. It could be argued that the same rule that assigns *ko* to animate NP's in the *ko*-sentences of Hindi assigns the dative *ko* to subjects of [ + atmāne ] transitive verbs that turn up as recipients in the causative sentences. More on *ko*-sentences is said in section 5.0 of this paper. It may also be argued that the same rule that assigns instrumental *se* to the passive agent assigns *se* to the mediary agents in causative sentences. This will not be further discussed in this paper. Sentences such as the following are derived by rules that include the subject-raising rule :

(i) mē ne ram ko xuṣ dekha  
'I saw Ram happy.'

(ii) ləṛkō ne cor ko sēdh katte hue dekha  
'The boys saw the thief breaking in.'

20. Unfortunately, Hindi does not provide clear cut data to support the claims made by the hypothesis that causativization involves a prelexical transformational rule of the kind mentioned above. Even so, the indirect evidence provided by other rules such as reflexivization, etc., the apparatus suggested by Balchandran for the dictionary entry of causative verbs and the remarks made by Krishnamurti all point to some such hypothesis. A non-Indo-European language, such as Telugu, may provide better data to support the hypothesis. (cf. Krishnamurti's examples 20 a, b and c where he claims '.....here, the reading of transitive verb is limited to 'Agent Orientation' represented by what an Agent "does" to bring about an event, short of bringing it about.' ( p. 28 ). Also, the paraphrase relation of 21a and b ( Krishnamurti, p. 29 ) corroborate the claim that causative forms represent complex semantic material.) No matter which languages provide the most satisfactory data, even Indo-European languages such as English and Hindi have syntactic properties which point to the same explanation of the causative phenomenon.

lexical) transformational rules. It has been argued that the animate NP's of sentences such as the following start out as the subject (not agent, but victim or experiencer) but are later marked with the dative postposition *ko* as recipients (Kachru 1970) :

21. *sīta ko ghər yad aya*  
'Sita remembered home.'
22. *šer ko goli ləgī*  
'The bullet hit the lion.'
23. *kəve ko bəhut pyas ləgī thī*  
'The crow was very thirsty.'

With regard to reflexivization, the *ko*- sentences behave exactly the opposite of causatives; e.g. the following are grammatical sentences :

24. *mujhko əpne bhaī pər bəṛa krodh aya*  
'I got very angry with my brother.'
25. *mohən ko əpne pər bhərosa nəhī he*  
'Mohan does not trust himself.'

Notice that there are active sentences corresponding to 24 and 25 in which NP's *mē* and *mohən* are grammatical subjects (agents) :

- 24a. *mēne əpne bhaī pər bəṛa krodh kiya*
- 25a. *mohən əpne pər bhərosa nəhī kərta*

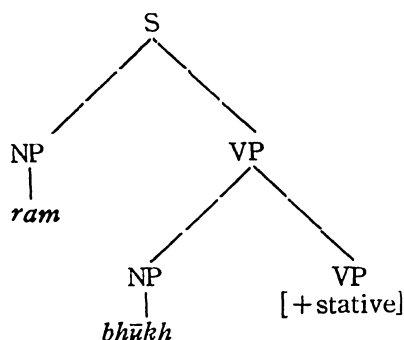
The reflexive *əpna* in 24a and 25a is straightforward, 24 and 25 raise some questions. It is clear that the reflexivization rule applies before the animate subjects are assigned the role of recipients, otherwise, the identity condition will not be met and hence the reflexive rule will be blocked.<sup>21</sup> There is some evidence to support

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21. The identity condition for reflexivization specifies that the item to be reflexivized must be dential to the subject of the S at the point at which the reflexive rule applies, (cf. Subbarao 1967).
  22. Compare the following sentences.
    - (i) *ram ko bhūkh ləgī*  
'Ram became hungry.'
    - (ii) *šyam ko gussa aya*  
'Shyam became angry.'
    - (iii) *sīta ko šərm aī*  
'Sita felt ashamed.'
    - (iv) *tumko dəya kyō aī?*  
'Why did you feel pity?'

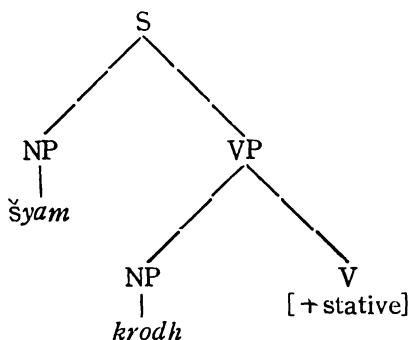
It seems abstract nouns denoting physical sensations of hunger, thirst, etc. contextually determine the occurrence of the stative *ləgna*

the claim that the lexical insertion of items such as *ana*, *lagna*, *hona* as verbs in *ko*-sentences is conditioned by the verbal feature [+stative] and also by features of abstract nouns such as *bhūkh* 'hunger', *gussa* 'anger', *šarm* 'shame', etc.<sup>22</sup> That is to say, the following underlying representations result in *ko*-sentences with stative verbs *lagna* and *ana* respectively :

B.



C.



whereas the abstract nouns denoting emotional reactions such as anger, shame, pity, etc. determine the occurrence of the stative verb *ana*. There are no non-stative sentences parallel to (i) but there are nonstative sentences with *karna* parallel to (ii)-(iv), e.g.

- (v) *šyam ne (X pər) gussa kiya*  
'Shyam was angry with X.'
- (vi) *kuch to šarm kəro*  
'Feel a little ashamed.' (a grammatical imperative)
- (vii) *išvər səb pər dəya kərə*  
'May God take pity on all.'



Notice that if the feature [+ stative] is replaced by the opposite feature [- stative] in C, the result will still be a grammatical sentence (viz. *šyam ne krodh kiya* as opposed to stative *šyam ko krodh aya*). In B, however, the feature [+ stative] is obligatory, there is no non-stative sentence *\*ram ne bhūkh kiya* parallel to *ram ko bhūkh lagī* 'Ram felt hungry'. This difference in the properties of *ko*-sentences with *lagna* vs. *ana* (also *hona*) is determined by the features of abstract nominal complements (such as *bhūkh* vs. *krodh*) of these verbs. The lexical insertion of *lagna*, *ana*, *karna*, etc. precedes the postlexical transformational rules such as the psych-movement rule and the dative rule which mark the NP of S in B and C as recipient and attach to it the postposition *ko*. These rules operate on the above underlying representations only if they contain [+ stative] verbs; if they contain [- stative] verb *karna*, the rules do not operate.<sup>23</sup> The marking rule and the dative rule follow the reflexive rule, therefore, sentences such as the following are grammatical :

26. *sīta ko əpna ghər yad aya*  
'Sita remembered her home.'

27. *tumko əpnī həkətō pər šərm anī cahiye*  
'You should be ashamed of your actions.'

This analysis of *ko*-sentences in Hindi explains why 28 is grammatical but 29 is not :

28. *mujhko uskī batē sun kər gussa a gəya*  
'Having heard his statements, I became angry.'

.....

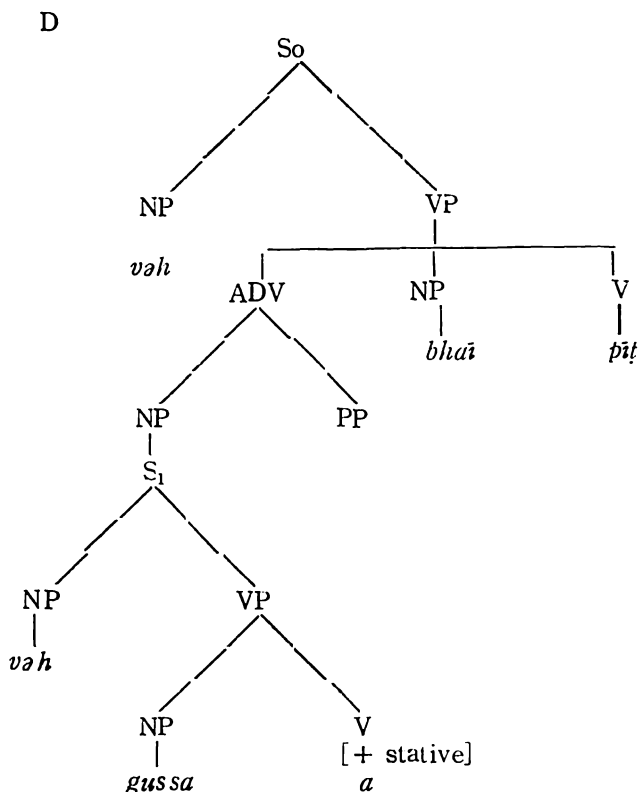
23. The rule that assigns the role of recipient to NP of S in underlying representations B and C does not involve any movement, unlike English where psych-movement involves moving the affected NP: nevertheless, there are two rules involved in Hindi, too, one that marks the appropriate NP as recipient, and the other that attaches the proper postposition to the NP thus marked. The same is true of the passive in Hindi as opposed to English. English passive involves moving the NP's, Hindi simply marks the agent as passive agent with *se*.

24. The hypothesis that features such as [+ stative] determine the occurrence of verbs such as *ana*, *lagna*, etc. and thus at least some *ko*-sentences are stative versions of parallel nonstative sentences with *karna* does not account for the total data of *ko*-sentences in Hindi.

29. \*(usko) gussa a kər usne bhaī ko pīta

'Having become angry, he hit (his) brother

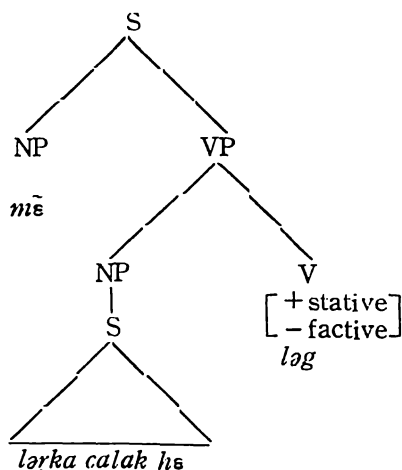
The hypothetical underlying representation of 29 is as follows :



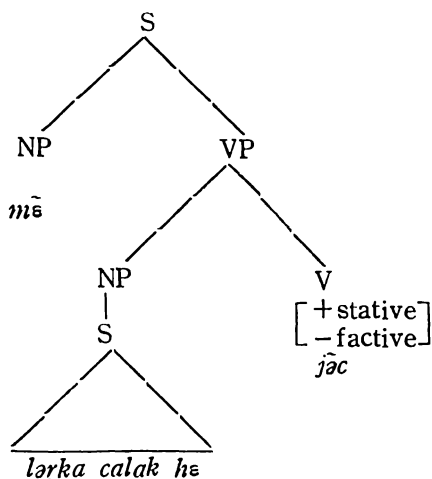
The lexical insertion of *a* is followed by the marking rule and the dative rule and as a result of these, the subjects of  $S_0$  and  $S_1$  are no longer identical, hence, the rule that embeds  $V-kər$  is blocked.<sup>24</sup>

5.1 The evidence to support the claim that the lexical insertion of stative verbs such as *ana*, *lagna*, etc. precedes several other syntactic rules is as follows. Both *jācna* and *lagna* take a sentential complement, i.e. the following underlying representations result in grammatical sentences :

E



F



The operation of complement-embedding, psych-movement and dative rules on E results in two grammatical sentences: *mujhko lagta hε̃ ki larka calak hε̃* and *mujko larka calak lagta hε̃*, whereas the operation of the above rules on F results in one grammatical sentence only: *mujhko larka calak jac̄ta hε̃*. That is, although the semantic properties of *lagna* and *jac̄na* are identical, lexically, *lagna* provides a choice between a *ki*-S complement and a complementa that results from the application of the subject raising rule, *jac̄na* only allows the operation of the subject raising rule.

6.0. To sum up the entire discussion, causative sentences in Hindi involve a prelexical rule of predicate raising, which is recursive. The lexical insertion of causative verbs, unlike in English, precedes other post-lexical transformational rules in Hindi. The same is true of stative verbs that occur in *ko*-sentences. Grammaticosemantic features of verbs such as [± atməne] play a significant role not only in surface marking of NP's in causative sentences but also in assigning correct semantic interpretations to such sentences.

Some of the results of the investigations in the nature of causative sentences in Hindi apply to other Indian languages also. I am not aware of any evidence which suggests that for some specific Indian language, it is necessary to posit two causative predicates, or, to assert that causativization is not a recursive process, or that causative rule is a postlexical rule. The assignment of roles and subsequently markers such as *se* and *ko* to various noun phrases in causative sentences is likely to be dependent upon features of innermost verbs as in Hindi, but, this needs support from data to which I only have limited access at present. Further investigation into the topic with data from various Indian languages will support many of the conclusions arrived at in this paper.

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# SOME ASPECTS OF COORDINATION IN TELUGU

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Coordination is one of the few topics that has received adequate attention in Modern Linguistics. I, however, think that there are many gaps in our knowledge of coordination process. It is hoped that some of the gaps might be filled, if we explore more non-Indoeuropean languages. This paper is an attempt to present some facts of coordination in Telugu, which may have theoretical bearing. In Telugu even the identification of these structures is not free of problems. In English, coordinate structures are easily identified by the occurrence of markers, which are called coordinators. Telugu seems to employ several linking devices for different types. Sometimes we see explicit morphemes and sometimes mere intonation or juxtaposition may mark the construction.

Coordination is one of the major mechanisms that makes language open or productive. Because of its important role we expect it in all human languages, though it differs in details. In English four types of coordinate structures are generally identified. 1. Additive or combinatory marked by *and*, 2. Alternative, marked by *or* and *nor* in negative, 3. Adversative, marked by *but* and 4. Causative, marked by *for*. The conjuncts that are coordinated by these markers should have some sort of grammatical equivalence, whatever that may mean.

## *Full Sentence Coordination*

There are two ways to conjoin the Telugu sentences. One is mere juxtaposition with no marker. When two sentences are uttered in a sequence, the mere sequence represents coordination. Hence, there are no constraints on the sequence, as we find in English. For example, in English an imperative sentence can be followed by a declarative sentence, conjoined by *and*, and the reverse is not possible as observed by Katz and Postal (1964) as in the following example.

1. Go home and I will give you a dollar.
- \*2. I will give you a dollar and go home.  
but in Telugu it is not only possible but preferable.
3. inTiki weLlu,      oka ruupaayi      istaa ( nu)  
home go,            one rupee            I will give.
4. oka ruupaayi      istaa ( nu ),      inTiki weLlu  
one rupee            I will give            home go.

Because of the absence of a coordinator in Telugu sentences, there is no restriction on the types of sentences that can be conjoined.

In English coordinate structures only forward pronominalization is possible, though both forward and backward pronominalizations are possible in subordinate structures depending upon the position of the subordinate clause. In Telugu identical NP deletion seems to play a role more than pronominalization. If pronominalization is possible, it is only forward. Even here the equi-NP deletion is more preferable.

5. ( a ) ataniki palukubaDi leekapooyinaa, Saastriki udyoogam dorikindi.  
Though he does not have influence, Sastri got a job.
- ( b ) saastriki palukubaDi leeka pooyinaa, ataniki udyoogam dorikindi,  
Though Sastri does not have influence, he got a job.
- ( c ) saastriki palukubaDi leeka pooyinaa, udyoogam dorikindi.
- ( d ) paluku baDileeka pooyinaa, saastriki udyoogam dorikindi.
6. ( a ) ataniki Dabbu leedu; saastriki peLLaam leedu.  
He has no money; and Sastri has no wife.
- ( b ) saastriki Dabbu leedu; ataniki peLLaam leedu.  
Sastri has no money and he has no wife.
- ( c ) saastriki Dabbu leedu, peLLaam leedu.  
Sastri has no money and has no wife.
- \* ( d ) dabbu leedu, Saastriki peLLaam leedu  
money is not to Sastri, and wife is not.

In (5) a and (6) a where backward pronominalization ( wrongly ) operated, the proper noun and pronoun are not coreferential. In (5) b and (6) b they may be coreferential but I think, it is ambiguous. 5, c and d, where equi-NP deletion operated, both orders, one with

the proper noun in the embedded clause another in the main clause, are normal. But in ( 6 ) d the order change is not tolerated i.e. only the latter identical constituent should get deleted but not the former.

In the above sets 5 and 6 where the surface subjects are different, forward pronominalization of dative phrases is allowed. But pronominalization is not possible between surface subjects if they are identical. Consider the following sentences :

7. ( a ) *saastr* *annam tinnaaDu*, *saastr* *kaaleejiki weLLiaaDu*  
*Sastri* ate his meal, *Sastri* went to College.
- ( b ) *saastr* *annam tinnaaDu*, *atanu kaaleejiki weLLiaaDu*  
*Sastri* ate his meal and he went to college.
- ( c ) *Saastr* *annam tini*, *atanu kaaleejiki weLLiaaDu*  
*Sastri* eating his meal, he went to college.

In 7 b and c *Sastri* and *atanu* " he " cannot be coreferential.

The above discussion on pronominalization suggests that it does not distinguish coordinate and subordinate structures in Telugu. It also suggests that coordination is pertinent only when there is some identical constituent in the conjunct sentences. Since there is no conjunct marker, sentence coordination has no relevance in Telugu where there is no constituent identical among sentences. When they are identical constituents, conjunction reduction applies. I will discuss in the following pages conjunction of Noun phrases and Verb phrases separately. Conjunction of other phrases is similar to Noun phrase conjunction.

### *Noun Phrase Coordination*

When two noun phrases have the same grammatical function in otherwise identical sentences, they can be coordinated in one sentence by conjunction reduction.

8. ( a ) *saastr* *maa inTiki wacciaaDu*. *saraLa maa inTiki waccindi*.  
*Sastri* came to my house. *Sarala* came to my house.
- ( b ) *saastrii*, *saraLaa maa inTiki wacciaaru*  
*Sastri* and *SaraLa* came to my house.



9. ( a ) neenu        bazaarununci        panDlu        tecciaanu  
                   I                    from market        fruits        brought  
                   neenu bazaaru nunci puulu tecciaanu  
                   I                    from market flowers brought.
- ( b ) neenu bazaarununci panDluu, puuluu tecciaanu.  
                   I                    from market fruits and flowers brought.

The functionally equivalent noun phrases of 8a and 9a are coordinated in 8b and 9b by lengthening the final vowel of each coordinated element. In the above sentences whether both the events took place at one time or different times, if at different times, what the chronological order is, are not expressed linguistically. Since noun phrases and timeless adverbial phrases are permutable with no significance of the order, this ambiguity is unavoidable unless we choose to disambiguate by employing time adverbials. Since verb phrases have time element included in them, the linear order signifies the chronological order, which we will see later.

The permutability of noun phrases seems to have some exceptions in Telugu and in other Indian languages. We have a set of compounds called Dvandva compounds where juxtaposition is a linking device. If both of the constituents are meaningful, they have alternative expressions with final vowel length as a coordinating device, otherwise they both are coordinated with no explicit conjoining morpheme and become stems for plural formation. Consider the following illustrations :

- 10.( a ) waaDiki talli leedu.    waaDiki tanDri leeDu  
                   To him mother is not. To him father is not
- ( b ) waaDiki tallii, tanDrii leeru  
                   To him mother and father are not
- ( c ) waaDiki tanDrii, tallii leeru  
                   To him father and mother are not
- ( d ) waaDiki tallidanDrulu leeru  
                   To him parents are not
- (\*e) waaDiki tanDri tallulu leeru  
                   To him father-mother are not

10( a ) to ( d ) can be considered as successive stages in the derivation. When the coordinating device is vowel length the

conjuncts are permutable. When they combine into Dvandva compounds, they are solidified and the order becomes rigid. Hence ( 10 ) e is ungrammatical.

The derivational steps in (10) suggest that Dvandva compounds can be derived from conjunction reduction. But we need some additional mechanism to fix the order of the constituents since they are not permutable. The formation of Dvandva compounds seems to be a problem of lexicalization. I do not know how to account for it with the existing mechanisms of Transformational theory. Whatever the shape of the mechanism that is needed for this purpose, it has to allow the grammatical transformations to feed back for lexicalization.

Dvandva compounds are of several kinds. In the compound that has been illustrated has two nouns, both are free, and thus can be derived from different sentences. There are other type of compounds in which the first constituent is a free form and the later constituent is a bound form which occurs uniquely in this distribution. This later constituent has no content. It only intensifies the meaning of the first constituent. Consider the following illustration :

- 11.( a ) waaDiki    teliwi            teeTalu    leewu  
                   To him        intelligence ( Pl )    are not
- ( b ) waaDiki    teliwi            leedu.    \*waaDiki    teeTa leedu  
                   To him        intelligence    is not.    To him        ?    is not

11 (a) cannot be derived by the process of conjunction reduction because the conjunct with *teeTa* does not exist. This means that the hypothetical mechanism is not powerful enough to account for all Dvandva compounds. Though the compounds of ( 10 ) and ( 11 ) namely *tallidanDrulu* " mother-fathers " and *teliwi teeTalu* " intelligence " look alike they need different mechanisms. If we mark *teliwiteeTalu* as a single lexical item we have to deny the claim that the plural nouns are derived by conjunction reduction. The compound *teliwiteeTalu* " intelligence " is not conceptually plural but I am not clear about the difference between conceptual plurality and grammatical plurality. There are some nouns like *palu* " milk " *niiLlu* " water " which are always used as plural nouns in Telugu. These cannot be derived by conjunction reduction anyway. But in *teliwiteeTalu* there are two identifiable constituents. We have seen that it

cannot be derived by conjunction reduction. It is not desirable to mark it as another lexical item because we obviously miss a generalization since any Telugu speaker can recognize it as a coordinated phrase. Besides, this is not an isolated instance but fairly productive. Telugu speakers often create such compounds, which can be taken as evidence that they have some device by which they generate.

There is a third variety of Dvandva compounds in which the second constituent means something elsewhere in the language but that meaning is not relevant in the interpretation of the compound.

In "pani paaTalu" *pani* means work and *paaTa* means song but the song has no relevance here for the interpretation of the compound. Like that in *raata kootalu*, *raata* means writing and *koota* means cut but it has no relevance here.

In some of these compounds, the constituents can also be used in pairs of conjoined sentences but with a restriction that the later conjunct sentence would always be used in sequence with the former conjunct sentence but never in isolation. Even here the later conjunct sentence with the second constituent does not mean different content than the former conjunct sentence. An illustration makes the point clear :

- |       |         |       |         |            |        |
|-------|---------|-------|---------|------------|--------|
| 12.a. | waaDiki | panii | leedu,  | paaTaa     | leedu  |
|       | To him  | work, | is not, | and 'work' | is not |
| b.    | waaDiki | pani  | leedu   |            |        |
|       | To him  | work  | is not  |            |        |
| c.    | waaDiki | paaTa | leedu.  |            |        |

(12) a can be decomposed into 12 b and 12 c. But 12 c in isolation is meaningless.

This brings up the problem of echo constructions which are like the above compounds, where the second constituent echoes or reiterates the meaning of the first constituent. These are formally similar to conjoined noun phrases because they are linked with final vowel length. In most of these compounds, the two constituents are partially similar in sound. They generally rhyme with each other. One such process is to replace the first consonant by *g-*. There are several other processes the details of which we are not concerned with. Like in (12) we can have conjoined sentences (of course with

the deletion of certain identical phrases ) as well as conjoined phrases but they are not reduced to Dvandva compounds. Consider the following illustrations :

13	a)	waaDiki	pillaaJellaa	leeru
		To him	children etc.	are not
	b)	waaDiki	pillalu	leeru
		To him	children	are not
	*c)	waaDiki	Jellalu	leeru
		To him	?	are not

As in 13 , here too, 12 a) can be decomposed into b and c while b is a possible sentence in isolation but c is possible only in sequence with b with the deletion of the identical dative phrase. Some of these can only be used in questions in negative sentences.

These echo constructions pose the same problem as Dvandva compounds in that the constituents have to be derived in a particular sequence. They cannot be derived from unordered pairs as Sanders ( 1967 ) would like to do.

There are still other types of echo constructions about which I have very little to say. In this type, the first constituent may be unique, or the total construction may be idiomatic even with the free constituent as its first member. In "maaTaa-mantii" *maaTa* means word or speech *mantii* has no distinct meaning. The total construction means 'chatting' and it is used in singular. In "piccaa-paaTii" both the constituents are unique and this construction also means 'chatting'. These look like idiomatic expressions hence they are unbreakable.

We have mentioned earlier that final-vowel-length of the constituents is a linking device in Telugu. The vowels of all the constituents should be lengthened to conjoin. This vowel has peculiar properties in Telugu. First of all it is used to conjoin only non-verbal constituents. Secondly, this can be used even when the constituents are not in immediate sequence. Thirdly and finally this can be used with conjoined or non conjoined phrases to mean *also, too, either* and *all*. The third point might give some clues to unify "also, too, either and all" -constructions with coordinate structures,



The sentences in (15) seem to be related to each other. If so, both in English and Telugu they may be derived from the same underlying structure. In (16) a is unambiguous, but b and c are ambiguous in Telugu. b seems to be ambiguous even in English. The sentences in 15 differ with the sentences in (15) in one of the interpretations only in negative.

The conjoined elements of (15) are disjoined in (16) b-c by the use of negative in the verb and coordinate reduction in one interpretation. In another interpretation they are derived from the adversative coordination as can be illustrated below.

- (17) (a) nuwwu tina leedu,      waaDu tinaleedu  
           You did not eat,        he did not eat
- (b) nuwwu tinaleedu,      waaDu tinnaaDu  
           You did not eat,        ( but ) he ate
- (c) nuwwu tinnaawu,      waaDu tinaleedu  
           You ate                    ( but ) he didn't eat
- (d) nuwwuu, waaDuu ( iddaruu ) tinaleedu  
           1. Both of you didn't eat ( only one of you ate )  
           2. Neither of you didn't eat.

(17) shows that disjunctive and adversative structures are realized in the same way and the conjoining morpheme namely vowel length is utilized for this realization. This means that conjunction, disjunction and adversary have to be identified by inferring deep structure and cannot be done on the basis of surface structure as can be done in English. Here the Telugu word that means "both", has some interesting aspects.

In Telugu, the cardinal numerals have two sets of forms, one set to be used with non-human nouns, another set to be used with human nouns. We need not concern with the morphological details here. The lengthening of the final vowels of these numerals has collectivizing function. Thus

renDu	"two"	renDuu	"both" (non-human)
iddaru	"two"	iddaruu	"both" (human)
muuDdu	"three"	muuDduu	"all the three (non-human)
mugguru	"three"	mugguruu	"all the three (human)"

The same process operates in other quantifying words too.

anni	“ all ”	annii	“ all of them ( non-human )
andaru	“ all ”	andaruu	“ all of them ( human )

The use of vowel lengthening process can be thought of as collectivizing process, here. These can be derived from coordination reduction in the following way.

okaTii, inkokaTii ... .. renDuu “ both ” ( non-human )  
 one and another  
 okaruu, inkokaruu ... .. iddaruu “ both ” ( human )  
 One person and another person  
 okaruu, okaruu, inkokaruu ... .. mugguruu “ all the three  
 One person, person and another person. persons ”  
 okaruu, okaruu ... .. okaruua ... .. andaruu “ all of them ”  
 One and another  
 ( where n is unspecified member )

The use of vowel length in both the places lends support to Sanders' hypothesis that numerals are derived by conjunction reduction. The English “ both ” can be interpreted as “ all the two ... both ”.

The above collective forms also have disjunctive function as well as conjunctive and adversative functions as noted in the ambiguities of ( 16 ) and ( 17 ).

This process ( Vowel lengthening ) has exclusively disjunctive function, when it is used with question words. The derivation can be illustrated as follows.

( 18 ) waaDuu leeDu, wiiDuu leeDu, ( ... x<sub>n</sub> leeDu ) ... ..  
 that-he is not this-he is not ( ... x<sub>n</sub> is not there

ewaruu leeru “ none of them is there ”  
 ( ewaru = who; ewaruu “ none ” )

These vowel-lengthened-interrogative forms can be used only with negative verbs and always signify disjunction, whereas the other vowel-lengthened quantifiers can be used with negative verb and can signify conjunctive, disjunctive and adversative functions.

#### *Verb-phrase coordination:*

In nounphrase coordination, the conjuncts are permutable with no semantic contrast either in Telugu or in English. In Telugu the

Dvandva compounds and echo constructions seem to be only exceptions for this generalization.

In verb phrase coordination the order of the conjuncts is relevant for the interpretation of chronology. All languages seem to utilize the linear order of the verb phrases to represent the chronological order. Let us see an illustration in Telugu.

- (19) (a) subbaraaw iDlii tinnaaDu  
 "Subbarao 'idli' ate"
- (b) subbaraw kaafi taagiaaDu  
 "Subbarao coffee drank"
- (c) subbaraw iDlii tinnaaDu, kaafi taagiaaDu  
 "Subbarao iDlii ate and coffee-drank"
- (d) subbaraaw kaafi taagiaaDu, iDlii tinnaaDu  
 "Subbarao coffee-drank and idli ate"

By conjoining 19 a and b we get 19 c and d. (c) and (d) differ in the order of the conjuncts and also in the interpretation of chronology.

More common device of conjoining two sentences with the same agent is to change the first verb, which represents the chronologically earlier action, into nonfinite participle like in the following sentence.

- (20) subbaaraw iDlii tini, kaafi taagiaaDu.  
 Subbarao eating idli coffee-drank.

(20) c and (20) are paraphrases of each other. In (19c) both the verb phrases are of equal grammatical status; since they both are finite verbs. In (20) the first verb is nonfinite and the second finite, hence they do not belong to the same grammatical rank. In (20c) if the conjunct phrases are permuted, it would still be a grammatical sentence (like in 19 d), but the chronology is disturbed. By permuting the verb phrases in (20) we get (21).

- (21) subbaraaw kaafi taagiaaDu, iDlii tini  
 Subbarao coffee-drank, eating idli.

(21) is not a normal sentence. The verb phrase with nonfinite form stands out of the sentence and should be interpreted as an afterthought. The chronology is not disturbed either. But 19a-c have to be posited as the earlier stages of derivation for (20), in



which case, earlier stages of coordination have to be said to have been resulted in subordination in the final stage. This brings up the problem of defining coordination. In English this problem does not arise because, the various stages of derivation do not differ in grammatical status of the final conjoined verb phrases. Dravidian coordination shows evidence for defining coordination only based on the underlying structures, for universal validity of the definition. (I raised this problem in an earlier paper.) (Ramarao, 1970).

Now we see, what happens in the negative version of (20). By negativising the first verb, we get (22).

(22) subbaaraaw iDlii tinakunDaa kaafii taagiaaDu  
Subbarao not eating idli coffee-drank.

(23, ab) can be posited as successively earlier stages of (23).

(23) (a) subbaraaw iDlii tina leedu. subbaaraaw kaafii  
taagiaaDu  
Subbarao idli ate not. Subbarao coffee drank.

By reduction and introduction of "kaani" but ...

(b) Subbaaraaw iDlii tinaleedu kaani kaafii taagiaaDu  
Subbarao idli ate-not but coffee drank.

Since *kaani* "but" shows up at some point in the derivation, we can recognise this (22) as a result of adversative coordination. The interesting point here is that the underlying combinatory and adversative coordinations chose to be realized by the same subordinating device.

As it is possible to negativise the first verb, it is possible to do the same for the second verb in (20).

(24) subbaaraaw iDlii tini kaafii taagaleedu  
Subbarao idli eating, coffee drank not.

(24) is ambiguous in two ways, as illustrated in the following paraphrases by extension.

(25) subbaaraaw iDlii tini, kaafii taaga leedu, paalu taagiaaDu  
Subbarao idli-eating, coffee drank-not but milk-drank.

(26) Subbaaraaw iDlii tini, kaafii taagaleedu  
Subbarao idli-eating, coffee drank-not

doose tini kaafii taagiaaDu  
 'dose'-eating, coffee drank.

In (25) negation applies to the later verb and in (26) it applies to the former verb. In both cases, the earlier stages involve adversative coordination. The movement of negative can be handled by some T-rule. The earlier stages of (25) and (26) are (27) and (28) respectively.

(27) subbaaraaw iDlii tinnaaDu kaani kaafii taaga leedu  
 Subbarao idli ate but coffee drank-not

(28) subbaaraaw iDli tinaleedu kaani kaafii taagiaaDu  
 Subbarao idli ate-not but coffee drank

It is also possible to incorporate negation in both the verbs.

(29) subbaaraaw iDli tinakunDaa kaafii taagaleedu.  
 Subbarao idli eating-not coffee drank-not.

(29) is a paraphrase of (30).

(30) subbaaraaw iDlii tinee kaafii taagiaaDu  
 Subbarao idli EATING, coffee drank.

(29) and (30) are emphatic statements and stylistic variants of each other. Like in English, we need a rule by which two negatives cancel each other by leaving emphasis.

The above discussion shows that adversative coordination is similar to combinatory coordination in many respects. It is instructive to note that there is no logical equivalent for adversative. (Dik, 1968 : 277). The adversative may be just a variety of combinatory coordination resulted by contrast of verbs—where in one of negative or negative like conjuncts, the expectation of the speaker unfulfilled.

In conclusion, the coordination or the types of coordination have to be defined in terms of underlying structures. Subordination need not be defined in terms of underlying structures because there are no known cases of underlying subordination realized as surface coordination.

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## ON DELIMITATION

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If a term applies to all the entities of a class, its application can be delimited by modifying it or by using a different term which applies only to a subclass of the initial class. Delimitation of modificatory type is done by addition of some of the defining features of the term. Addition of features in this manner can be done to the extent of not changing the original definition of the term to an irrevocable form.

In our languages nouns or substantives denote entities, concrete and non-concrete. It is well-known that a noun, for that matter a word, is not the object it denotes. A noun is a class of indefinitely large number of tokens. This is the difference between a lexical entry of a noun and the noun occurring as a constituent of a sentence. Thus, the noun *book* has a lexical entry *book*. The lexical *book* is defined by certain features. Let us accept the definition of *book* as 'physical object having more than one sheet of paper bound together'. In this definition we are ignoring several features like the specification of the physical state of *book*, say, solidity. Likewise one can take a single long sheet of paper and make several folds of same length and breadth and stitch or glue at one edge and get a book out of a single sheet of paper. Now when an imperative sentence *Give me a book* is uttered by a speaker in an ideal speaker-hearer-context<sup>1</sup>, the hearer, if he is sincere and wants to fulfil the desire of the speaker, has the liberty to pick up a book in the world, no matter which, and give the same to the speaker. Now let us suppose the speaker has uttered another sentence *Give me a red book*. Obviously, the hearer

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1. Let us assume that there is at least one hearer when this particular utterance is produced. This may be a written message, then the hearer is the reader of the message.

can supply only a red book, if he is sincere and so on. Thus, what traditionally was called as a modifier is really performing delimitation of modificatory type. The application of the term *red book* is narrower than that of *book*, since all red books are books whereas all books are not red books. Further addition of modifiers to a noun may continue to delimit its denotation further and further. Thus, the terms *hard-cover red book*, and *paper-back red book* are still narrower in application than the term *red book*.

Delimitation has its own limitations. It is not possible to delimit a term by adding features to it which contrast with some or all of the defining features of term. Thus, we cannot have a *liquid book* since the definition of *book* has solidity as one of the features and liquidity and solidity are contrastive. By violating this we get *green ideas* and *purple bananas*.

Delimitation has a range. It does not depend upon the numerical aspect of the entities denoted by the terms. Thus, delimitation may be of the same range in the case of *book* as well as *publisher*. But it is controlled by the feature complexity of the definition of a term. The lowest possible range of delimitation is seen in the case of participant nouns. Here the possible range of delimitation is null, since participant nouns are themselves internally delimited to the maximum extent. Next come the so-called proper nouns or names. It is now well known that what we were taught about proper nouns as being always definite is false. A proper noun can be as much in need of delimitation as any other non-participant noun is. Syncategorematic implications are also seen in the process of delimitation. Thus, *a big ant* and *a small elephant* are syncategorematically delimited. This depends on the relative nature of modifiers—what is big in case of an ant may not be big in case of an elephant. Thus a definition should contain features which denote what is accepted as an average quality.

Taking complete indefiniteness at one end we will again trace towards maximum delimitation. The speaker-hearer situations are of three types: (1) both speaker and hearer have indefinite knowledge regarding the entity denoted by the noun in question, (2) speaker has definite knowledge of the entity denoted by the noun in question but doesn't communicate it (the definite knowledge) to the hearer, and (3) speaker has definite knowledge of the entity

denoted by the noun in question and presumes that the hearer also has definite knowledge of the entity denoted by the noun in question.

Instances of the first type of situation we have already examined. In this situation the speaker has indefinite knowledge and conveys the same indefiniteness to the hearer. This is a case of null external delimitation. Circumstantial implications or hearer's prejudices are of no concern to us.

In all these situation types the speaker-hearer communication may be about more than one entity. In the first type of situation if the speaker intends to denote more than one entity the usage of numerals comes into effect. Many of the Indian languages use the numeral 'one' in this situational type when a single entity needs to be denoted. When there are many entities to be denoted appropriate numerals are employed. Perlmutter (1970: 233) has argued that the indefinite article is represented in deep structure not as an article but as the numeral *one*. Its deep structural origin must therefore be the same as that of other numerals. Specifying that indefinite article is equal or the same as *one* does not lead us completely to an answer. Instead, we can modify it as: in the first situational type an article is used to denote 'one/two...n of the entities denoted by the noun, no matter which'. In Perlmutter's analysis both *a/an* and *one* have singularity and indefiniteness as their constituent features. He gives instances (p. 237) of *a one* and *one one*. The indefiniteness can be brought out from the numeral as a feature which is again represented by a form homophonous with 'one'. In Telugu this is possible even when the numeral is used to denote two or more than two entities. Thus, we can have *renḍu pustaka:lu* 'two books' or *oka renḍu pustaka:lu* 'two books'. *oka* otherwise means 'one'. Languages like English use other devices like *any* or *some* in this case.

The second situational type is more complex but was less discussed in the existing literature. Strawson's (1971:25) *arch* use of *a* and Hutchins' (1971:90) 'unmarked sememe' *a* are some instances. Hill (1966:222) has felt that *a dog bit me* is quite as definite, particular, and singular as the sentence would be with the article *the*. Bierwisch (1970:32) distinguishes the *specifying* function of *a*. But the confusion between the indefinite article representing the feature *indefinite* and the 'indefinite' article representing the

feature *specifying* was not made clear by him. Rather, he specifies that the indefinite article represents the feature *indefinite* in the sense illustrated by him only if it appears within the scope of intentional verbs like *ask for, want, look for, will* etc. The range of 'intention' included in a verb is not strictly definable. We may have to enter into ontological discourse to find out whether 'having a dream' is intentional on the dreamer's part or not. The intentional verbs mentioned by him allow both types of usage of his indefinite article, i.e., *indefinite* and *specifying*. His example is: *James asked me for a newspaper*. The discourse that follows it may be (a) *and I will send it to him*, or (b) *and I will send one to him*. When (a) is selected as the continuation of discourse we can call *a* of *a newspaper* as *specifying* and when (b) is selected then *a* of *a newspaper* will be understood as *indefinite*.

The same situation gave rise to Quine's paradox (1960:147): "indefinite singular terms need referential position because they do not refer". In his treatment *someone* is an indefinite term but still needs a reference to somebody when used in a sentence like *The commissioner is looking for someone*. His paradox is a result of non-distinction of definite knowledge and indefinite knowledge from speaker's point of view. Let us take the set of sentences:

- (1) The commissioner is looking for someone.
- (2) I am looking for someone.

In both (1) and (2) the speaker is performing a speech act and conveying certain message to the hearer. In (1) the speaker is reporting what another person, the commissioner, was doing, whereas in (2) the speaker is stating what he himself is doing. (1) is two way ambiguous; in this instance the speaker may be having definite knowledge of the person (someone) for whom the commissioner is looking, or he may just be stating a fact which he learnt either by the commissioner's communication to him or through some other sources. (2) is unambiguous; if one says that he is looking someone (and if we take him seriously, and if he is not joking and if 'someone' is not a contextual abbreviation of, say, 'one who can do this work' etc.) we are sure that the speaker is searching for a specific person. As we have seen the ambiguity is partly allowed by the non-participant subject in the first sentence, whereas, the selection of a participant as a subject eliminates such ambiguity.

This situation we shall call as speaker-specific situation and the delimitation involved is partial and it is slanted towards the knowledge of the speaker.

The third type is the source of the much discussed definite reference and gives rise to complete delimitation, delimitation to the maximum extent. Application of a term can be maximally delimited to apply to one or more than one specific entities. Like both the previous types of situations this also depends on the knowledge of the speaker and hearer. In our definition of this situation type we employed a clause that 'speaker presumes that hearer has definite knowledge of the entity denoted by the noun in question'. This presumption on the speaker's part is the factor which involves several other complexities. Some of the complex points are what is meant by hearer's knowledge, how is the definite knowledge acquired by the hearer, of which we shall discuss briefly about the latter and leave the former to philosophers. Acquisition of definite knowledge of an entity or entities may be due to several reasons. Some of them are: knowledge of the world, situational context, inherent definiteness and prior experience. The definiteness expressed in *President of India* is mainly due to the knowledge of the world. There may be hundred presidents in the world but constitutionally the presidentship of India is assigned to one and only one person at a time. The philosophical controversies over the meaning and definiteness in the much discussed phrases *the present king of France, the unicorn, the Pegasus* etc. do not concern our analysis proper. Second reason is exemplified by the sentence *Close the door*. When uttered in a room which has only one door which is open or many doors out of which only one is open, the definiteness will be fully understood. The hearer may have the previous knowledge about this condition i.e., presence of only one opened door, or may acquire it as soon as the utterance is understood. That is, after hearing the speaker's command, the hearer may look around for a particular door which is open and may close it. If any one of these conditions are not fulfilled the utterance may not be understood which may further lead to a query from the hearer asking for more delimitation. Third reason was already noticed by us in the case of participant nouns. Though the participant nouns have the widest possible number of tokens, that is only when we take humans into consideration, as compared to proper names, their application is



absolutely delimited in a given speaker–hearer context. A peculiarity of every participant noun is that it is not transitive from speaker to hearer or vice versa.

We have noticed that the speaker presumes hearer's definite knowledge of the entity denoted by the noun in question. We have also observed that this presumption needs to be modified. The modified version will be that the hearer has definite knowledge of the entity denoted by the noun in question and if the hearer doesn't possess the required knowledge he (the hearer) acquires it (the required knowledge) soon after hearing and understanding the utterance in question.

This knowledge which was acquired by the hearer has an important role to play in referring. Referring is an intermediary step between acquired definite knowledge and extreme delimitation. In other words, extreme delimitation except in the case of participant nouns is dependent on the reference which again is dependent on the hearer's knowledge. We shall concentrate on the last reason for acquiring definite knowledge viz., previous experience. Previous experience can either be linguistic or non-linguistic. Linguistic experience is acquired by hearing somebody say something. If the hearer listened to what was said by the current speaker or some other person he has participated in a linguistic experience, which will impart some knowledge about some entities in his mind. For instance, in a typical story telling situation, the teller announces: *Once upon a time there was a king.* The knowledge of the being of a particular king was acquired by the hearer. Non-linguistic experience is well known. Definite knowledge acquired from either of these types of experiences can be utilized for reference. It should be noted that when an entity is referred it is the knowledge of that entity that is referred. If we continue our story telling as: *Once upon a time there was a king; The king had seven sons,* after acquiring the knowledge about a particular king the hearer gets some more information regarding the king. By saying *the king* in the second sentence the speaker intends to say that 'you know a particular king'. This is what is meant by presuming hearer's definite knowledge about the entity denoted by the noun in question. In the second sentence another bit of information about the king is included, that the king had seven sons. The second sentence should be

interpreted as 'you know a particular king and the particular king had seven sons'. Now let us add one more sentence in the story: *He had no daughters*. The crucial point is that more and more knowledge about the king gets accumulated while the story proceeds. But whenever the king is recalled the primary knowledge that will be recalled is about the existence of that particular king. The third sentence in the story need not be understood only as 'the king who had seven sons had no daughters' but in fact it will be understood as 'you know a particular king and the particular king had no daughters'. This is not to deny that the occurrence of 'a particular king' in the above case denotes in addition to the existence of the king in question his having of seven sons. But the king's having seven sons is a knowledge of secondary type. Thus a distinction between primary knowledge and secondary knowledge is necessary. Let us take a complicated instance: the Bach-Peter's Paradox as quoted in Karttunen (1971:157). A sentence like *The pilot who shot at it hit the Mig that chased him*, paradoxically, cannot be derived from a finite underlying structure. The error of infinity is due to the proposal of deriving this sentence through a process of relativization and more due to the notion that at every step the additional amount of knowledge included should also made part of the derivatory process. Let us see the problem from the view proposed in this paper. The sentence *The pilot who shot at it hit the Mig that chased him* can be broken down into the following sentences:

1. There was a pilot
2. There was a Mig
3. The Mig chased the pilot
4. The pilot shot at the Mig
5. The pilot hit the Mig

Sentences 1 and 2 announce the existence of a particular pilot and a particular Mig respectively. Sentence 3 tells that the Mig which you know chased the pilot whom you know. Sentence 4 tells that the pilot whom you know shot at the Mig which you know. Sentence 5 further tells that the pilot whom you know hit the Mig which you know. A complete knowledge of what happened in this sequence is expressed both by the set of sentences 1-5 and the original complex sentence.

We noticed that the extremely delimited term is often 'replaced' by a 'pronoun'. Let us examine the nature of 'pronouns' briefly. It is clear now that the so-called first and second person pronouns which we called as participant nouns are not pronouns at all but rather constitute a special subclass of nouns. Their application can't be further delimited. Rest are third person 'pronouns'. A third person pronoun like *he* has certain features common to the noun it 'replaces'. These features are called as gender features. These are basic to every noun. In pronominalizing a noun what we actually do is to delete all other features which do not form part of the gender; these deletable features are called as extra gender features. In Telugu, *du* is traditionally called as a masculine suffix (denoting nominative). In my analysis (Bhaskara rao : Forthcoming) it is shown to have the gender feature [ + Human masculine ] and no other extra gender features. A noun like *mogudu* 'husband' has the feature [ + Human masculine ] and in addition certain other extra gender features that define 'husbandness'. In 'pronominalization' all the extra gender features are deleted leaving the essential gender features only. That is why we get ambiguous sentences like, *John knows what he wants* compared to unambiguous *John knows what she wants*. So 'pronominalization' is a kind of feature deletion.

Languages employ two or more types of spatio-temporal demonstrative expressions to denote different degrees of proximity and remoteness. The delimitation brought out by deixis is mainly spatio-temporal. Thus, extreme delimitation can be brought out by employing a demonstrative which is usually accompanied by extra-linguistic acts. In the case of demonstrative expressions also, knowledge of the speaker is definite regarding the demonstrated entity. Hearer may have previous definite knowledge or may acquire it soon after the hearing and understanding of the message of the speaker. The degree of proximity or remoteness is usually speaker centered.

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## SOME UNSOLVED PROBLEMS IN GENERATIVE PHONOLOGY

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If a theory is to be established as a new paradigm, it must transform the imagination of the professionals in the field; it should reevaluate current methodological procedures and should try to alter ultimately the concept of basic 'constructs' of prevailing theories. (Constructs, here, should be understood as those non-logical terms which represent 'basic notions' of a given system and which are implicitly defined by the fundamental uninterpreted postulates of a theory.) This aim can be achieved by the adherents of a competing theory in various ways. They can show that these constructs are not the valid elements of the theory in question; hence, they have no independent justification for their existence. Or, they can demonstrate that the constructs are not logically construed and formally defined and, therefore, it is not possible by any set of rules provided by that theory to relate the constructs with the various facts of observation without creating anomalous situations and producing contradictory results. This has been, in fact, the primary nature of the attack by adherents of Generative Phonology on the basic constructs i. e. the phoneme, syllable, etc. of Taxonomic and Stratificational grammars. Cf. CHOMSKY (1957, 1962, 1964); CHOMSKY and HALLE (1965, 1968), HALLE (1959, 1960, 1962); LEES (1957, 1961); MCCAWLEY (1967a); POSTAL (1968); SCHANE (1968); SAUMJAN (1962, 1965)

However, it is quite possible that an earlier theory has constructs which are not entirely incompatible with the observable data. Some of its aspects may even be required by the new theory. In fact, no theory starts from scratch. Thus, a competing theory may broaden the concept of the constructs or it may redefine them with a different import of meaning. For example, it may provide evidence to show that it has not achieved the desired level of universality and is there-

fore restricted in application to a limited set of data. In order for a theory to have explanatory power atleast one of its postulates must be 'more general' than the rules for the observable data being explained ( NAGEL, 1961 ).

On the other hand, a competing theory may refer to the same observable data by something significantly different. This is important because apparently identical constructs may contain different sets of values. Constructs, being the nonlogical terms of basic postulates articulated by a given theory, always import meaning by virtue of occupying their defined places within the general framework of the postulates. And, as all the basic postulates of two theories are never the same, meaning and value do vary from theory to theory' even if the term is used to refer to similiar observable data.

A specific example of what we are referring to is provided by MCCAWLEY ( 1967b ). He examines ' the question of the extent to which a segment in SAPIR'S phonologic representations can be identified with a segment in the dictionary representation of a morpheme in a transformational grammar. ' Similarly, CHOMSKY uses the Jakobsonian feature system and discusses its role in the dictionary representation of morphemes, a role very different from the Jakobsonian concept of distinctive feature as a part of the general description of language and accordingly, considers these features, rather than phonemes, as an ' end point' in the network of opposition. Nevertheless he rejects Jakobson's notion that features of the phonological inventory should be a subset of the non-redundent features extracted from the fully specified matrix of the phonetic level. According to Chomsky, phonologic features are merely ' value ' references, i. e. classificatory devices with no direct physical meanings, and thus they must be sharply differentiated from the relative yet " concrete " features of the phonetic scale.

This is all because when ' paradigms change, the world itself changes..... ( and this does ) cause scientists to see the world differently' ( KUHN, 1968: 110 ). But it is incumbent upon the competing theory to prove that the changed world-view can handle problem better than its competitors.

As mentioned above, it is the feature ( and not the segment ) which generative phonology accepts as its ultimare construct. Adherents of this theory are unanimous in holding that distinctive feature

coupled with the metatheory of simplicity metric would provide a measure to evaluate alternate phonological descriptions on the basis of what is natural linguistic process and what is not. Take the following two rules ( 1a and 1b ), as discussed by Halle ( 1962 : 336-7 ).

$$\text{R. 1a. } a \longrightarrow \text{æ} / - \left\{ \begin{array}{l} i \\ e \\ \text{æ} \end{array} \right\}$$

$$\text{R. 1b. } a \longrightarrow \text{æ} / - \left\{ \begin{array}{l} i \\ p \\ z \end{array} \right\}$$

Both the rules are identical in their formal aspects and if phonemes are regarded as indivisible entities, both rules will have to be conceded as natural rules. With feature as an ultimate construct one is able to take the advantage of specifying / i, e, æ /: as members of a natural class and the rule ( 1a ) as a natural rule. 'The failure of the simplicity criterion in the latter case is due to the fact that the notion of natural class has no obvious meaning if phonemes are regarded as indivisible entities' ( HALLE, 1962 : 337 ). By accepting ' feature ' as its basic construct, generative phonology leads one deeper to the inner mechanism of the sound system of a language than any previous model.

A competing theory is always a process in action. It develops in face of hitherto unresolved problems. Some of the problems which it has to face can be pseudo-problems while others may be characterized as genuinely intricate ones. One of the pseudo-problems which has recently come up for a serious discussion is the value specification of a feature; how are features to be characterized—Unary, binary or multinary? Is it that the value specification of a feature conditioned by its occurrence on different levels of representation?

Thus, according to CHOMSKY and HALLE ( 1968 : 298 ) ' The features have a phonetic function and a classificatory function. In their phonetic function, they are scales that admit a fixed number of values, and they relate to independently controllable aspects of the speech event or independent elements of perceptual representations. In their classificatory function they admit only two co-efficients, and they fall together with other categories that specify the idiosyncratic properties of lexical items.' Those who hold this view are in favour of dividing the phonological component of a grammar into two parts

—the phonological rules (P-rules) which accept the set of features with binary values and phonetic rules (MCCAWLEY'S (1968:143) feature-interpretation rules (FI rules) or POSTAL'S (1968:66-8) detail rules) which are based on the set of features with multinary values; the latter add the language specific details to the systematic phonetic representations.

Latest writings on the intrinsic content and the formal representation of feature system has revealed that the problem of value-specification for features has not yet been resolved. For example, CHAFE (1970) considers that even the classificatory features, like semantic ones, are singularly in nature while, according to Ladefoged (1970), for some phonetic parameters like the vowel height, phonological features should invariably be multivalued. Both of them are critical of the way CHOMSKY and HALLE make the evaluation procedure though both invoke the notion of natural class based on the concept of simplicity metric.

These divergent approaches within the theory of generative phonology is not to be taken as symptomatic of any inner conflict or contradiction of a theory itself. In fact, the situation has arisen because these linguists have failed to establish a logical and consistent relationship between theory and praxis, between theoretical constructs and mapping out these units unto psychological and physical 'realities' with proper quantifications and specifications on in-between different levels.

LADEFOGED (1967:58), for example, talks about three stages of sound units which a theory of phonetics must be capable of handling — (1) the stage of the allocation of speech-sounds to contrasting categories. (2) The stage of the designation of relative values of each category and (3) the stage of interpretation of these values in terms of measurable units. These three stages correspond to CHOMSKY and HALLE'S (1964) three modes of description—systematic phonemics, systematic phonetics and physical phonetics respectively. But it must be born in mind that the types or modes of descriptions are not the levels of representations.

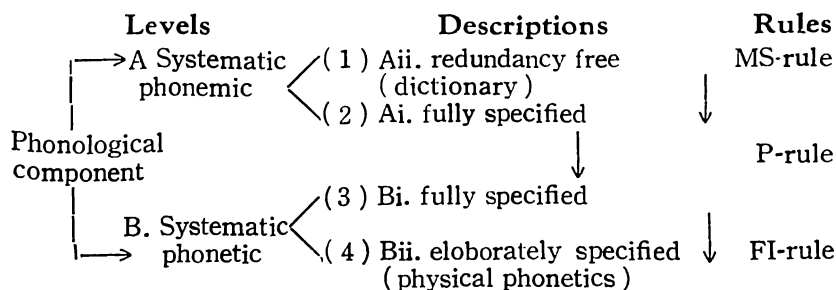
Generative phonology establishes only two levels of representations which are qualitatively distinct from each other i.e. the level of systematic phonemics and the level of systematic phonetics. Units on both these levels are represented by a fully specified matrix.



When the systematic phonemic level is subjected to its redundancy-free version one gets a less specified dictionary model of description (STANLEY, 1967). Similarly when the description of a systematic phonetic level is further elaborated by giving a detailed account of specification of the degree with which a feature exists in a specific language then one gets the type of phonetic description which can be termed as the description in physical phonetics. For example, a description on the systematic phonetic level tells only whether a phonetic segment is voiced or unvoiced while the description which the physical phonetics offers has also the potentiality of telling that initial stops in one language (English) has only 15 degree of voicing whereas the other (Hindi) has 45 and the third (French) has 60 degree of voicing.

The fact that dictionary and physical phonetic representations are only a different mode of descriptions for systematic phonemic and phonetic levels respectively is well attested by the nature of rules which operate between the two modes of descriptions—morpheme structure (MS-) rules between dictionary and systematic phonemic representations and feature interpretation (FI-) rules between systematic phonetic and physical phonetic representations. These are not the type of rules which change the value of any given feature and thus, are distinct in function from the phonological (P-) rules which operate between the two levels of representations—systematic phonemic and phonetic; MS- and FI- rules are feature additive rules while P-rules may be characterized as feature-switching rules.

The two levels and four modes of description related by their respective types of rules can be hierarchically ordered, as given below.



As the functions, which a feature system has to discharge on the two distinct levels, are qualitatively distinct, their nature and

potentiality of configuration must clearly be distinguished. Phonological and phonetic functions of a feature system though related are not to be conceived as identical in nature. 'In the current literature on generative phonology, it is frequently assumed implicitly (a) that the set of phonological features used in lexical representations are rather directly reflected in the set of parameters relevant in phonetic descriptions, i.e., in nearly a one-to-one fashion, and (b) all the features are coordinate with each other, as opposed to being hierarchically organized. We are gradually disabusing ourselves of these assumptions, even though the exact nature of either how phonological features are translated into phonetics, or how some features dominate others in a hierarchy and how some features group into 'super features' is a matter that is far from worked out.' (WANG, 1971)

Though phonological and phonetic features are qualitatively distinct, nevertheless, one should not consider that only phonetic features are substantive while phonological features are merely arbitrary categorization devoid of any content. It is true that the phonological features deal with units which are psychologically real but as psychological reality is reflective of physical reality, phonological features must be constrained in terms of the set of universal phonetic matrices. Finally, units of a system are always relational in nature.

It is important to note that phonetic features are units of systematic phonetic level and hence, like phonological features they are also relational in nature. This is the reason that 'when discussing places of articulation it seems especially necessary to bear in mind that the categories are required simply for distinguishing linguistic oppositions' (LADEFOGED 1967:22). However, apart from distinguishing linguistic oppositions, an adequate phonetic description must be capable of specifying the characteristics of a given language as opposed to other languages. It is in respect to the latter demand that we really need the elaborately specified description of physical phonetics.

The claim which I want to make here is that the two basic representations of the two levels (i.e. fully specified phonemic and phonetic matrices) must use the feature system with the binary value as they deal either with the 'contrasting' categories or with

the 'relative' values of these categories. On the other hand, the stage of physical phonetics can use features with multinary values as it has to specify the specific characteristics of the sound categories not only relational to other sound categories of its own system but with the sound units of some other languages.

Those linguists who have not maintained this sharp distinction between the two different modes of descriptions of otherwise the same systematic phonetic level have rather confused the issue; for example, CHOMSKY and HALLE'S 'The Sound Pattern of English' (SPE) is full of such misgivings. Writers of SPE have confined the phonetic function of a feature system to the physical phonetics. This is because, according to them, only the phonemic function of a feature system, admit two coefficients. In their phonetic function, features are invariably scales that admit a number of values related to 'independently controllable aspects of the speech event.' It is for this reason that we get a clumsy picture of their stress rules which have six levels of realisations. Linguists like VANDERSLICE and LADEFOGED (1971), WANG (1971), OHALA (1970) etc. have pointed out that there is no empirical evidence whereby one can correlate the six values of stress to the 'independently controllable aspects of the speech or independent elements of perceptual representations.' Infact, SPE ingeniously expounds with proper justification the general theory of generative phonology but their analysis of English sound system, as WANG (1971) has rightly stated, it is 'based primarily on the phoneme like transcriptions of KENYON and KNOTT and the pioneering studeis on stress done by NEWMAN, SMITH and TRAGER.'

Arguing in favour of multivalued phonological features pertaining to vowel heights LADEFOGED (1971 : 28) has recently remarked- "Anyone who accepts the notion that different levels of stress can be specified in phonological rules surely should have no difficulty in accepting the notion of vowel height as a multivalued feature.' But surprisingly enough in a paper written in joint authorship with VANDERSLICE, he (1971 : 22), proposes a set of six binary features for the suprasegmentals- (1) Strong (2) Accent (3) Intonation (4) Cadence (5) Englide and (6) Emphasis which 'accounts for English accentual and intonational distinctions in an intuitively satisfying view'. In conclusion they assert 'that our features fit

naturally and harmoniously into the stress cycle of the Sound Pattern of English.' One may also say that anyone who is in favour of proving the validity of binary features for suprasegmentals should have no difficulty in accepting the notion of binary coefficients for vowel heights.

One may point out that the cause for uneconomic and complicated phonological rules rests not in the binary value of feature system but it lies in the unmotivated and empirically unjustified choice of the feature specification. For example, LADEFOGED's four possible values of a vowel height can be captured provided we accept WANG's (1968) proposed binary features with which he is able to provide an alternative solution to the English vowel shift which is economical and no more complicated.

Let us take the specifications of CHOMSKY and HALLE's (1968 : 304-8) proposed features like High, Low and Back for which SPE expands a detailed justification. These features are 'basically revised versions' of Jakobsonian 'diffuseness', 'compactness' and 'gravity'. The motivation for this modification is to extend the application of these features to a wider range of data, and also to account for certain phonetic facts of different languages in a more generalized yet unambiguous way : i.e., these revised features, apart from taking care of all the phonetic facts covered by Jakobsonian features, explain also the phenomena of palatalization, velarization and pharyngealization in a more systematic way. Furthermore, these 'features specifying the position of the body of the tongue are now the same for vowels and consonants.'

It would be interesting to see how these features configure in the P-rules dealing with cases of assimilation. In SPE we find three P-rules related with the three sets of consonants, as given below :

\* Set I [  $k^+$  ;  $g^+$  ]  $\longrightarrow$  [  $c$ ;  $j$  ] Velar softening rule. R II

Set II [  $t$ ;  $c$ ;  $d$  ]  $\longrightarrow$  [  $s$ ;  $z$  ] Spirantization rule. R III

Set III [  $t$ ;  $d$ ;  $s$ ;  $z$  ]  $\longrightarrow$  [  $\check{c}$ ;  $\check{j}$ ;  $\check{s}$ ;  $\check{z}$  ] Palatalization rule. R IV

It seems that three sets have been organized in SPE on the basis

.....  
 \*/ $k^+$ ,  $g^+$ / belong to the derivable category of velar stops contrasting with / $k$ ,  $g$ /. / $G$ / is the dental affricate.

of phonetic similarities rather than on the identity of phonetic processes. Is it not that the part of the velar softening rule (R IIa) is a case of palatalization.

$$R\ IIa \quad g^+ \longrightarrow \check{j} / - \left\{ \begin{array}{l} i \\ e \end{array} \right\}$$

If yes, then why is this part of the rule not put with the more generalized rule of palatalization i. e., R III? These three sets can be re-set on the basis of the assimilatory processes which are more explanatory in nature.

$$\text{Set A. } [k^+] \longrightarrow [c] \quad R. \text{ IIb.}$$

$$\text{Set B. } [t; c; d] \longrightarrow [s; z] \quad R \text{ IIIb.}$$

$$\text{Set C. } [t; d, g^+; s; z] \longrightarrow [\check{c}, \check{j}; \check{s}, \check{z}] \quad R \text{ IVb.}$$

For this re-set, the velar softening and palatalization rules will be like R IIb and RIV b and not as R II and RIV of SPE.

$$R \text{ II. } \left[ \begin{array}{l} - \text{cont} \\ - \text{ant} \\ + \text{deriv} \\ < - \text{voice} > \end{array} \right] \longrightarrow \left[ \begin{array}{l} + \text{cor} \\ + \text{strid} \\ < + \text{ant} > \end{array} \right] / \text{---} \left[ \begin{array}{l} - \text{back} \\ - \text{low} \\ - \text{cons} \end{array} \right]$$

$$R \text{ IIb. } \left[ \begin{array}{l} - \text{cont} \\ - \text{ant} \\ - \text{voice} \\ + \text{deriv} \end{array} \right] \longrightarrow \left[ \begin{array}{l} + \text{cor} \\ + \text{strid} \\ + \text{ant} \end{array} \right] / \text{---} \left[ \begin{array}{l} - \text{back} \\ - \text{low} \\ - \text{cons} \end{array} \right]$$

$$R. \text{ IV} \quad \left[ \begin{array}{l} - \text{son} \\ + \text{cor} \end{array} \right] \longrightarrow \left[ \begin{array}{l} - \text{ant} \\ + \text{strid} \end{array} \right] / - \left[ \begin{array}{l} - \text{back} \\ - \text{voc} \\ - \text{cons} \end{array} \right] \left[ \begin{array}{l} - \text{cons} \\ - \text{stress} \end{array} \right]$$

$$R. \text{ IVb. } \left[ \begin{array}{l} - \text{son} \\ \alpha \text{ ant} \\ \alpha \text{ cor} \end{array} \right] \longrightarrow \left[ \begin{array}{l} - \text{ant} \\ + \text{strid} \end{array} \right] / - \left[ \begin{array}{l} - \text{back} \\ - \text{voc} \\ - \text{cons} \end{array} \right] \left[ \begin{array}{l} - \text{cons} \\ - \text{stress} \end{array} \right]$$

A palatalized consonant is invariably a [+high] segment but neither the actualized segment nor the determining context is characterized by this feature. Vowels which are [-back, -low] R II. or [-back] R IV. have been shown in SPE to assimilate [-ant] to [+ant] or [+ant] to [-ant]! How can a [-low] vowel switch the value of [+high] to [-high] and how can the feature [+back] assimilate [+ant] to [-ant] in one part, and

[+ant] to [-ant], in an other part to the same rule! This clearly shows that the classificatory scheme of distinctive features in SPE is far from being consistent and internally cohrent.

We find palatalization and libialization as cases of assimilatory processes in many languages. HYMAN (1970) discusses the two rules for Nupe (a Kwa language of Central Nigeria).

$$R. V. C \rightarrow C^w / - \begin{Bmatrix} u \\ o \\ \text{ɔ} \end{Bmatrix}; [+cons] \rightarrow \begin{bmatrix} +round \\ +high \end{bmatrix} / - \begin{bmatrix} +round \\ V \end{bmatrix}$$

$$R VI C \rightarrow C^y / - \begin{Bmatrix} i \\ e \\ \text{ɛ} \end{Bmatrix}; [+cons] \rightarrow \begin{bmatrix} -back \\ +high \end{bmatrix} / - \begin{bmatrix} -back \\ V \end{bmatrix}$$

It is counter intuitive to think that features like [+rouud] and [-back] cān be a condition for switching the values of a feature for a consonant to [+high]. Furthermore, Hyman's presentation of two rules does not capture a significant fact of generalization that the two superfecially distinct processes are the result of the same change with opposite values of features - backness and roundness. Fante dialect of Akan language also attests the cases of palatalization where labials, dentals and velars get palatalized before i, e. (SCHACHTER and FROMKIN, 1968). The incompatibility of SPE's feature system for the rules for this dialect has been revealed by FROMKIN (1968).

It is important to understand the reason of the failure of SPE's feature system in revealing the true nature of assimilary processes, for it will be equally applicable in other cases. From an articulatory point of view, vowels which are [-back] fall under the palatal region and [+back] under the velar region. The difference between. palatal consonants and [-back] vowels or back vowels and [+back] consonants lies not in the place of articulation but in the degree of constriction. Thus, if vowels like i, e, and ε have to form a natural class with č ǰ ε and j they must invoke the feature [palatal] instead of the feature [high].

CONTREAS (1969) has recently argued that the binary value of a feature conflicts with the simplicity criteria in the sense that rules which are intuitively more general are not consistently simpler than less general rules. But I find Contreas' objection more against Halle's

simplicity criteria which is mechanical in procedure than against the binary value of a feature system as such.

According to HALLE (1969) it is the simplicity measure which defines the notion of 'natural class'; 'We shall say that a set of speech sounds forms a *natural class* if fewer features are required to designate the class than to designate any individual sound in the class.' If we have to capture the linguistically significant generalizations we have to reverse this process i.e., we have to condition and define the notion of simplicity by the naturalness conditions. Otherwise, we find the classes of vowels having feature complexes [ $\llcorner$  back  $\llcorner$  round] i.e., i, e,  $\epsilon$ , u, o,  $\text{ɔ}$  and [ $\llcorner$  low,  $\llcorner$  round] i.e.  $\text{ɪ}$ ,  $\text{æ}$ ,  $\text{ɔ}$  which have the same number of features, nevertheless, which cannot be said to be equally natural. Similarly, a class having a feature complex [ $\llcorner$  vocalic,  $\llcorner$  high] is simpler than the previously mentioned two classes on the basis of Halle's mechanical procedure of feature counting but intuitively it appears to be far less a natural class.\*

I have elsewhere stated (SRIVASTAVA, 1970:187-8) that the term 'simple' does not mean simply 'elegant' and 'beautiful' and the notion simplicity measure, in no sense, invokes the method of HALLE'S mechanical procedure. A logically simpler statement may not always be mathematically simpler. Following POPPER (1965) I mean by simple rules those rules "which tell us more, which have greater empirical content and which have a higher degree of alsifiability". By the term natural rule, I mean those rules which have a greater degree of probability and of law like regularity within and across languages. One may thus, assert that it is the content of features coupled with the notion of simplicity that decide the question of naturalness.

A theory may evolve a filtering device through which the intrinsic content of its constructs is filtered as to reveal 'natural' or 'expected' cases from others which are 'unnatural' and

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\* It is surprising that though authors of SPE are aware of these facts and they are theoretically in favour of defining 'natural class' on the basis of intrinsic content of features, throughout, in their rule formulations for English, make use only of formal properties of features and feature specifications.

unexpected'. This filtering device can be only a part of a *model* for the interpretations of a grammar. The *markedness* principle is a part of a model constructed by generative phonology and this, serves as the element of the filtering device; it is in fact, a set of conventions for the interpretation of a grammar in a more natural way. What I want to claim here is that we get singular features only when binary features are filtered through the Marking Conventions.

Supporters of singular features have obviously lost sight of the sharp contrast between the feature specification for a grammar of a given language and the filtered value of these specifications coming out of the theory of a grammar. For instance, CHAFE (1970) also talks of marked and unmarked value of a feature correlating it with the concept of 'cost' which is 'the amount of physiological energy expended in the production of a phonetic feature'. He states - 'Now, it might at first seem enough to say that any segment which is glottalized or nasal is marked in that respect, while the one that is not, is unmarked. Glottalization and nasality could then be regarded as singular, not binary features, either present or absent in a particular case. It costs something to have them there, a segment without them costs less, all else being equal.' The same demand is achieved through marking conventions with a difference that these conventions have a powerful in-built apparatus for marking a segment with features with its cost - least costly 'U' or more costly 'M' and, at the same time, have the potentiality of converting U's and M's into the binary value for that feature.

The assignment of Marked or Unmarked status to a feature is based on the hypothesis which suggests that certain values for features universally cost more than others; a less costly value is more frequent, appears invariably in position of neutralisation is acquired earlier in language learning, is lost later in aphasic conditions and has increased power of change-resistance in the course of language development. Significance of marking conventions lies also in eliminating many MS-rules because 'in the new theory neutralizations will be treated by U markings in the dictionary and these will be converted to the 'normal' values by completely universal rules. If 'normal' values are actually those occurring, nothing more need be said in particular grammars.' (POSTAL, 1968 : 172).



At present, generative phonology is faced with a true problem of finding out the explanations why any particular sound is more or less highly valued. This area is anticipating further investigation. The required explanation can be offered only after we substantiate a feature system with its 'intrinsic' content. To fulfill this demand, a tentative set of marking conventions have been proposed in SPE but that is far from being satisfactory on various accounts.

Some of the problems which promise further research are : ( i ) It is not clear, for example, whether the intrinsic content of a feature is determined by the articulatory, acoustic or perceptual phenomena or it is a result of combination of various factors? In order to understand the naturalness of common phonological processes, features must be defined with respect to their 'intrinsic' content. But the difficulty lies in the fact that 'ease of production, the relative frequency of sounds, early acquisition etc., fail to give any formal characterization of why any particular sound is more highly or less highly valued and that relative frequency does not constitute an explanation for the relative frequency' ( LIGHTNER, 1965 ).

( 2 ) If we accept a model common to both articulation and perception we have to take into account the reality of minimal units for the different stages of production and perception. Based on the experimental findings and logical deductions made by KOZHEVNIKOV and CHISTOVICH ( 1965 ), I accept at the very outset that the minima unit of programming is 'syntagm' ( -a semantic unit which is a sentence or part of a sentence articulated at one output ), the unit of articulation is 'syllable', the unit for recognition is 'phoneme' and the unit for discrimination is 'feature'. ( SRIVASTAVA 1970a ). It is pertinent to ask a question, -is the 'intrinsic' content free from the influences of units of other stages? If not, then we are not clear how to integrate the various influencing factors in a composite whole?

Even for features like a 'syllabicity' we have no articulatory or acoustic correlate which could determine the intrinsic content of this feature, nevertheless, there is enough empirical evidence in favour of its existence. By not accepting 'syllabicity' as a feature, SPE has denied the entry of a unit of psychological reality for native speakers of all languages are intuitively aware of how many syllables there are in their articulated speech.

(3) JAKOBSON (1968:64) has talked about a sequence of common laws of solidarity attested universally by the development of child language, the dissolution of aphasic language, and the synchrony and the diachrony of the language etc. We are unable to know as to what should be the decisive factor in determining the intrinsic content of a feature in a situation where the law of solidarity succumbs to conflicting criteria.

We are told about the predominance of the vowel / a / because it emerges as the first optimally simple vowel. This gives it a status of unmarked. But the vowel reduction rule of SPE or stratificational analysis of Bulgarian vowel system (LOCKWOOD, 1969) results in the fact that the Schwa [ə] is the most unmarked vowel. Are we, like Lockwood, to say that Markedness is not necessarily universal 'but rather a matter which is to be decided individually for each language'? If we accept the Markedness conventions as universal and vowel reduction as a language specific instance then, in fact, we make the M-U criteria devoid of any intrinsic content because 'many investigations suggest that the schwa-like vowel shows less displacement of the articulators. (FROMKIN, 1968:165).

Furthermore, in SPE we find [e] as a 'neutral state vowel' and features like High and Low are consequently defined in reference with the tongue posture for this vowel. But one is at a loss to know why [e] is considered to be a 'neutral state vowel' when [a] is accepted as the most basic and optimal vowel?

(4) Markedness conventions of SPE is a mass of varied and incongruous rules. One can easily discern three different types of rules - (1) formal (2) intrinsic and (3) linking. Rules of the type R. VII, and VIII are merely definitional which reveal nothing. Intrinsic rules like R. IX change all the M and U specifications in the lexicon to + and - values in a more expected and natural way. Linking rule of the type R, X change the subordinate features (voicing) after the rule has changed the value of a feature sonorant which dominates it.

R. VII [ + low ]  $\longrightarrow$  [ -high ]

R. VIII [ + high ]  $\longrightarrow$  [ -low ]

R. IX [ u nasal ]  $\longrightarrow$  [ -nasal ]

R. X [ u voice ]  $\longrightarrow$  [ + voice ] / [  $\overline{\text{+ nas}}$  ]

As evident from the linking rule of the type R X, a change in unvoiced consonant to a marked feature [nasal], entails in a natural way switching of value for the feature [voice]. This establishes a concept of feature hierarchy i.e., [nasal] is more dominant a feature than [voicing].

Obviously, SPE has not anticipated that features may be of coordinate type also. Let us take some marking conventions for vowels, as stated in rules XI a, b and XII a, b.

R. XI a. [u back]  $\longrightarrow$  [  $\propto$  back ] / [  $\frac{\text{---}}{\propto \text{round}}$  ]

b. [m back]  $\longrightarrow$  [-back] / [  $\frac{\text{---}}{+\text{round}}$  ]

R. XIIa. [u round]  $\longrightarrow$  [  $\propto$  round ] / [  $\frac{\text{---}}{\propto \text{back}}$  ]

b. [m round]  $\longrightarrow$  [-back] / [  $\frac{\text{---}}{+\text{round}}$  ]

According to this convention /i/ can be represented as (a) [-round, U back] or (b) [U round, -back]. WANG (1971) is right in commenting that in such cases 'either representation yields the right result, but there is no non-arbitrary way of choosing between them. Such indeterminacy in the theory is clearly undesirable.'

(5) It is beyond doubt that a convention based on the notion of 'cost' where cost is correlated with the amount of physiological energy expended in the articulation of a feature, will depend upon the context. SPE conventions have not shown that a context determines when a feature is marked and when it is unmarked. For example, a nasal in the context V—C will be always unmarked if it is homorganic to the following consonant. Similarly, a non-sonarant speech-sound in the intervocalic position will defy the SPE's convention (R. XIII) and yet be unmarked.

R. XIII. [U voice]  $\longrightarrow$  [-voice] / [  $\frac{\text{---}}{-\text{son}}$  ]

(6) Another interesting field of investigation is to find out the quantum of influence an environment exerts on the 'intrinsic content of a feature for a given segment. A number of experiments

in experimental phonetics ( LINDBOLM, 1963; OHMAN, 1964 ) suggest that it is possible to quantify the extent to which a substantive property of a segment is changed because of the influence of the adjoining speech sounds. OHMAN (1967) has even offered a mathematical formulation which does handle most of the variables of assimilatory processes.

The problem is how to incorporate these recent findings in the marking conventions. Phonetician like Ohala goes even to the extent of saying that 'we can either give up or try to represent all these assimilatory changes by the one general rule or we can adopt a new system for representing these processes. Let us abandon the Chomsky and Halle feature system for the representation of this process - infact, let us abandon features.'

Nodoubt, that the problem of weightage assignment to a given feature concomitant with some other dominating or subordinate features has not been yet explored properly. But this does not mean that the feature system has no potentiality of carrying over this demand.

Some interesting observations have been made by CHEN (1971) as regards to the palatalization and nasalization processes. His survey and analysis of over 600 Chinese dialects shows that 'if palatalization occurs at all, the process hits the velar nasal first, then the dentals; the labial nasals are the last of the initials to undergo palatalization. This observation can be generalized: palatalization sprseads from the back to the front series, regardless of nasality, voicing, aspiration and the features.' And further, 'The process of nasalization progress is clearly from low to high and front to back vowels..... The direction along with denasalization progress is just the opposite to that of its reverse process of nasalization.'

Problems like the above have induced recent work in generative phonology to find their right answers. At times, one finds that answers offered so far are no answers and contributions of this theory still hang over major unresolved issues. But one must not loose sight of the fact that a competing theory always embibes its life-source from hitherto unresolved problems and develops by asking even those genuine questions for which it has no ready-made solutions. It is in no sense disheartening to find the limitations of its own model and be aware of them for changing and reshaping.

That is why the writers of SPE have stated in their preface – ‘No system of rules that we have proposed has survived a course of lectures unchanged, and we do not doubt that the same fate awaits the grammatical sketch that we develop here’ (1968, X).

Without realising the real significance and contributions of a theory, one may even go to the extent of stating that ‘in the history of linguistics, the theory of markedness will go down as the most adhoc of all adhoc measures proposed in the field’ (OHALA, 1971). At the same time, one has also to accept that the problems related to the ‘intrinsic content of features’, though still to a certain extent unresolved problems, nevertheless, are genuine problems which break the stultifying areas of investigation. Nodoubt, ‘Chomsky and Halle have probably contributed as much to the progress of linguistics by the wrong answers which they present in SPE as by the right answers (MCCAWLEY, MS) because of the fact that in SPE they are bold enough to face certain genuine yet unresolved problems in phonology.

Furthermore, an important claim involved in such unresolved problems should be stressed. It is also an important fact of a theory that the total concept of any given theory is not limited to its ‘constructs’. NAGEL (1961:91), apart from the abstract calculus which is fundamental to any theory and which implicitly defined these constructs, points out two more components, for a scientific theory, i.e., a set of operational rules which ‘assign an empirical content to the abstract calculus’ and ‘a model for the abstract calculus’. Generative phonology must not be viewed as a shaky or wavering theory because of its wrong answers as most of the unresolved problems hinge over the later two constituent parts of a theory – i.e., the part which either evolves a leak-proof apparatus for formalizing the operational rules or which construes a faithful model for its abstract calculus. Problems related to the value specification to its basic constructs like feature system which pertain to the area of its fundamental postulates, as discussed above, are merely pseudo-problems.

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