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Patterns In Clause, Sentence, and Discourse

in selected languages of India and Nepal

Part I, Sentence and Discourse

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Table of Contents

Acknowledgments	v
Introduction	1
Semantic Relations Between Whole Propositions in English Ronald L. Trail.	5
Sentence Patterns in Halbi Fran Woods	35
Sentence Patterns in Kupia R. B. and J. E. Christmas.	125
Sentence Patterns in Tamang Fay Everitt.	197
Clause Patterns in Parengi-Gorum P. Richard Aze	235
Paired Semantic Components, Paired Sentence Reversals and the Analysis of Dhangar-Kudux Discourse Kent H. Gordon and Kenneth L. Pike	313

Introduction

We present in this volume five languages of India-Nepal from four different language families--Halbi, Kupia, and Parengi-Gorum of India, and Dhangar-Kudux and Tamang of Nepal. Halbi and Kupia are Indo-Aryan languages spoken in Madhya Pradesh and Andhra Pradesh respectively. Parengi-Gorum is a Munda language spoken in Andhra Pradesh and Orissa. Dhangar-Kudux is a Dravidian language spoken in southern Nepal. It is a dialect of the Kudux of India. Finally, Tamang is a Tibeto-Burman language of Nepal.

We focus in this volume on sentence--four of the papers are on sentence description and the paper on Dhangar-Kudux discourse has implications for sentence analysis. The paper, "Clause Patterns in Parengi-Gorum," has been included here in order to balance the sizes of Parts I and II of the report. For the theory underlying this paper, see the article, "Toward the Systematization of Display Grammar," by Austin Hale in Part II.

All of the sentence papers build on the ground work laid by Robert E. Longacre (1967, 1968, 1970, 1972, and the two papers co-authored with Ballard and Conrad 1971). There are, however, certain modifications which we would like to suggest. One is regarding the place of sentence in the grammatical hierarchy. The other is concerning the ranking of relationships within a sentence. Both are discussed in the paper, "Sentence Relations Between Whole Propositions in English."

We feel that the proper context in which to study relations between propositions is discourse. We found in our study of sentence that some sentence links and relators tended to fluctuate in meaning from informant session to informant session especially when sentences were previously elicited out of context. Within a discourse, however, a particular relation is much less likely to be ambiguous and the language assistant is put on a much firmer footing when having to answer questions about that relation. No doubt quick elicitation of several sentence types is possible depending on the ability of the language assistant. Unless, however, these sentences are checked in context, the linguist cannot be sure of either the meaning he has assigned or of the possibility of a finer distinction in meaning.

2 Patterns in Clause, Sentence, and Discourse

Gordon and Pike have reversed this order in their paper on Dhangar-Kudux by studying discourse structure via a heuristic known as sentence reversal. The beauty of this approach is that it studies linguistic units in context and hence the language assistant is perfectly at home in giving judgments about whether certain sentences or groups of sentences can be reversed and if so what adjustments are required to make the change. The method is based on the assumption that the language assistant will only reverse units which are in some way complete in themselves. By starting with sentence size units, the linguist not only discovers much of the structure of paragraph and discourse begins to unfold as well.

Paired Semantic Components, Paired Sentence Reversals and the Analysis of Dhangar-Kudux Discourse

Kent H. Gordon and Kenneth L. Pike

A. Introduction.

The purpose of this paper is to explore further the practical and theoretical implications of using paired semantic components and paired sentence reversal as tools for linguistic research. For the paired semantic components approach we build on the work of others such as Wise and Green (1971) but with our emphasis shifting here to analysis of levels above the Sentence. For the sentence reversal approach we build on the work of Pike and Pike (1971) and Pike and Schoettleindreyer (1972).

The mechanics of our approach is simple. Given a story with sentences numbered in order,² we take each possible combination of juxtaposed paired sentences, 1-2, 2-3, 3-4, etc., and perform two experiments. First, we attempt to describe explicitly for each pair of sentences what the semantic relation is that lies between them. Whenever it turns out that we are unable to describe for a given pair of sentences what that specific relation is we try to describe the relation between that sentence pair, taken as a whole, and the next sentence. And so on. Second, we attempt to reverse the order of each possible pair of juxtaposed sentences so that we obtain 2-1, 3-2, 4-3, etc. As we proceed with this experiment we check with native language assistants to see if the particular reversals are acceptable to them.³ Often their acceptance of a particular reversal is accompanied by various degrees of insistence that some grammatical adjustments be made (e.g., readjustment of particles, tenses, etc.) to compensate for the 'upset' caused by the reversal. In each case, furthermore, the reversal is rejected unless it is possible (after the grammatical adjustments indicated) to preserve the original truth-value and content of the narrative. That is, all chronological and logical relations existing among the various parts of the original text must be preserved after the reversals and concomitant adjustments have been made.

Parallel to the procedure with paired semantic components, whenever a pair of sentences do not appear to be reversible, we proceed to ask if that particular pair of sentences, taken as a whole, is reversible with the next sentence in the text. Thus, we are interested not only in the

reversibility of sentences, but in the reversibility of parts of texts larger than sentences. Similarly, we are interested in describing the semantic relations existing between parts of texts larger than sentences.

These mechanical manipulations should be considered as no more than easily usable devices to study the structures which interest us. We wish to see if we can find firm experimental evidence (experimental in terms of these mechanisms) which will help us to discover and study the characteristics of units larger than the sentence; and to study these units phonologically, semantically, and grammatically with their inter-relationships. The emphasis is on alternative, but semantically similar, grammatical structures (forced by the mechanics of sentence-reversal), since we have stated the requirement that the truth-value must not be changed.

Before discussing these matters, however, we must first specify certain assumptions relevant to the inquiry.

B. Assumptions About Universals of Human Nature Underlying the Validity of our Results.

Coherence of Discourse. We assume that the speaker of a discourse intends that his discourse be coherent. We at this point are not interested in texts where the speaker is known to be attempting to obfuscate an issue, or is known to be insane.

Assuming, then, that coherence is intended by the speaker, how can we, as hearers and interpreters, demonstrate that his text is in fact coherent? Perhaps, as Bellert (1970) tells us, it will not be possible to demonstrate that his text is, in fact, coherent. The speaker may fail to make explicit certain semantic relations between parts of his narrative because he assumes that his hearers know certain things, which in fact they do not.⁴ At such points we are unable to demonstrate that the text is coherent. Or, to put it another way, if we assume that he intended his text to be coherent but find it is not completely so, we shall conclude that we are unable to specify what the semantic relations are between certain parts of the text. In general, therefore, a text is demonstrated to be coherent if and only if the semantic relations existing among its parts are specifiable, unambiguously, at time of authorship by the audience it was intended for. We say 'at time of authorship' because it may be possible for a text to be interpreted unambiguously by some of the hearers and yet for their interpretation to be incorrect. Only the author would be able to make such a judgment.⁵

Intelligibility. We assume that it is possible for a hearer to understand a text in his language within a universe of discourse which is familiar to him.

How can the hearer demonstrate that he does so understand? One kind of evidence is a performative one. If the text says to shut the door, the hearer can show his understanding by proceeding to shut the door. A second kind of evidence--and the one which concerns us vitally here--is his ability to paraphrase the text which he has heard. Unless he can paraphrase the text in such a way that the author of it can say, "Yes, that is what I said," there may be no strong evidence that he has understood it. (We do not distinguish here between paraphrases which are either expansions or abbreviations (or summaries), from paraphrases which are of approximately equal length.) If the text is to be coherent, and if the hearer is to understand, the speaker will be talking or writing about the real world of his audience or the putative real world of his universe of discourse, or he will not get the work done which he wants. He will fail to get verbal or other response in terms of agreement, learning, or some other form of paraphrase; or else he will be treated as mad, outside the community, or a buffoon.

Focus Shift. We assume that a universal human capacity allows an individual to change focus of attention from one part of a discourse to another or from one characteristic of an event to another and that these changes of focus, when involving repetition of a discourse, result in a re-focussed paraphrase of that discourse. This ability to change focus is a prime epistemological capacity universal to human speakers, and paraphrase is one result of that capacity. We assume, that is, that an acceptable reversal of sentence order with the accompanying necessary grammatical adjustments is an experimental analogue of a paraphrase which might have resulted naturally from an appropriate change of focus.

Since the native speaker is able to change focus and thereby to generate different paraphrases of a given description of an event, it is similarly assumed that the native assistant of our reversal sets is often able to adjust the reversed forms grammatically to be appropriate to some paraphrase potentially acceptable within his own system. If he is unable to find any such adjusted grammar, we may assume tentatively, subject to later revision, that such a focus change may have been blocked by some semantic or grammatical constraint somewhere in the system.

It has been previously reported (Pike and Pike, 1971) that Gleason states that inversion of chronological sequence is not allowed in Kate (New Guinea) narratives, and that, therefore, words like 'after' and 'before' do not occur in Kate. Thus, we affirm that focus changes are possible, including some kinds of reordering, but we do not attempt to specify as a universal precisely what the limits of focus change are, nor exactly where they will be seen. That study must be an empirical one. And it is for this reason that we are interested in the Dravidian material given here, as over against the Tibeto-Burman materials of Sherpa and the English material of the initial articles (Pike and Schoettelndreyer, 1972, and Pike and Pike, 1971). Eventually the studies need to be extensive enough to allow careful comparison--a goal still far in the future.

Context Sensitivity. It is further assumed that in normal language usage a sentence does not mean anything apart from discourse, but that a sentence only has meaning as a point in a larger structure. That is, we are interested not in the meaning of abstracted sentences—which in some sense do not occur "in nature"—but in the relationship of sentences to discourse both in meaning and in form.

This, then, relates to questions about the "grammaticality" or appropriateness of any one sentence. Rather than attempting to say that a sentence does or does not occur, is or is not grammatical, is or is not aberrant, we ask whether or not a sentence is or is not a paraphrase of another within the context of the given discourse.

C. The Sample Text.

The text which we now wish to analyse in the light of the preceding assumptions is given with interlinear literal translation, followed by a key to morph abbreviations, and the free translation.⁶ Single slash represents sentence boundary; double slash, paragraph boundary; and triple slash, discourse boundary.

1. eek din mankhu-s-hi tanGg-io tam-ba-r-nu
one day Mankhu-m,s-NR 3,Rfl-mother 3,Rfl-father-hpl-iLoc
- jhagRa manj-a ker-a / 2. tam-ba-s ba'-d-as
fight become,pt-3,s Aux,pt-3,s 3,Rfl-father-m,s say-prt-3,m,s
- eeee mankhu kal-a paRh'-a-ge iskul / 3. tanGg-io bi'-i
hey! Mankhu go-impv read-IA-PrpInf school 3,Rfl-mother say-3,s
- jee mala maa-kaal-o-s / 4. i-san kaam-dhandha nee na'-o /
no neg-go-ft-3,m,s this-Loc work who do-ft,3,s
5. khiti-kola baari-jaari too i-san nee na'-o / 6. see mala
farming gardening then this-Loc who do-ft,3,s so not
- too maa-kaal-o-s paRh'-a-ge // 7. ho-n:e-m hoy-te
then neg-go-ft-3,m,s read-IA-PrpInf that-Mnr-E become-Mnr
- hoy-te-m du-nu-goRe-ne jhagRa manj-a ker-a / 8. bas
become-Mnr-E two-IA-hC-iLoc fight become,pt-3,s Aux,pt-3,s
- mankhu-s huN tanGg-io-bi baat-an khanDi-as-ki cala
Mankhu-m,s also 3,Rfl-mother-NR word-Acc out,pt-3,m,s-ptc go
- ker-as // 9. aa-s huN paRh-te paRh-te cha-Th-ma kalas
Aux,pt-3,m,s that-m,s also read-Mnr read-Mnr six-IA-ord class

- paRh-as / 10. tekar-baad-nu ambi-as cic:-as
read,pt-3,m,s this-after-iLoc leave,pt-3,m,s Aux,pt-3,m,s
- paRh-na-n / 11. tam-ba-s huN baac-as amb-a
read-nom-Acc 3,Rfl-father-m,s also say,pt-3,m,s leave-impv
- ca'-a baw:a paRh-na-n / 12. ni-nG-hai kaam joker
Aux-impv son read-nom-Acc 2-s-NR work appropriate
- manj-a ker-a / 13. see ambi-as cic:-as //
becoms,pt-3,s Aux,pt-3,s so leave,pt-3,m,s Aux,pt-3,m,s
14. ambi-as cic:-as khiti-kola na'a hel-r-as /
leave,pt-3,m,s Aux,pt-3,m,s farming do-Inf begin-mid-3,m,s
15. pac-ma cha-Th-ma kalas paRh-as / 16. ak:u dunia-
five-ord six-IA-ord class read,pt-3,m,s now world
- daari kud:i-as nanj-as kud:-a lag-d-as ///
travel,pt-3,m,s Aux,pt-3,m,s travel-Inf ImpAux-prt-3,m,s

Key to Morph Abbreviations:

m	masculine	Imp	imperfective
s	singular	PrpInf	purpose infinitive
NR	nominal relator	neg	negative
3	third person	ft	future tense
Rfl	reflexive	Mnr	manner
hpl	human plural	E	emphatic
iLoc	inner locative	hC	human classifier
pt	past tense	Acc	accusative
Aux	auxiliary	ptc	participle
prt	present tense	ord	ordinal
impv	imperative	nom	nominaliser
IA	inflectional augment	2	second person
mid	middle voice	Loc	locative

Free Translation.

1. One day Mankhu's mother and father had a fight. 2. His father said, "Hey, Mankhu, go to school and study." 3. His mother said, "No, he will not go! 4. Who will do the work around here? 5. Who will do the farming and gardening? 6. So there! He will not go to school!"
7. In just that manner, back and forth, they quarreled between themselves. 8. At any rate, Mankhu disregarded his mother's word and went off to school to study.
9. He studied and studied; he studied up to the sixth class.

10. After this he left school. 11. His father also said, "Leave school, son. 12. It is time for you to begin the work you were cut out to do." 13. So he left school.

14. He left school and began to farm. 15. He studied into the fifth or sixth class. 16. Now he has begun to travel around--he is now traveling around.

D. Phonological Groupings.

Major phonological breaks occur between Sentences 6 and 7, between 8 and 9, and between 13 and 14. Phonologically we need to specify how these breaks differ in kind from phonological breaks which mark the end of other sentences. At the end of such 'other' (non-final) sentences a pause may occur, but the pitch right after the pause may take up where it left off with no appreciable change in height. During such sentences there may be a slight downdrift, and the overall effect is such that these non-final sentences, taken as a group, drift downward with respect to pitch. At the end of such sentence-groups (1 through 6, 7 and 8, 9 through 13, and 14 through 16), however, there is a further general drop in pitch accompanied by fading intensity. Then across the phonological boundary to the next sentence-group a sharp upstep in pitch occurs. This upstep in pitch is notably lacking at the onset of other (non-final) sentences.

In the sample text we have represented the major phonological breaks with double-slash lines. We will call the phonological groups, which these breaks delimit, phonological paragraphs.

Paragraph 1	Sentences 1-2-3-4-5-6
Paragraph 2	Sentences 7-8
Paragraph 3	Sentences 9-10-11-12-13
Paragraph 4	Sentences 14-15-16

E. Semantic Groupings.

In this section we discuss what we mean by semantic linkage (1), and by indeterminacy of paragraph boundaries (2). We then discuss the notion of semantic relations across parts of the text and their importance for positing semantic groupings (3). Then, we illustrate what we mean by semantic immediate constituents with mention also of embedding as a feature of paragraph structure (4). There follows a tabulated account of the semantic relations we posit for the text (Figure 1), two diagrams illustrating how to make use of Figure 1 in plotting the semantic structure of the text, and then a detailed discussion of inter-paragraph and intra-paragraph semantic structure with formulas illustrating the latter (5). Finally we present a tree-structure representation of the results of our

preliminary semantic analysis (6). See Figure 4.

1. Linkage.⁷

The surprising element in the phonological analysis given above is that Sentence 7, at the beginning of the second phonological paragraph, is very closely linked, semantically, with what has been narrated in the first paragraph. If we allow the boundaries of semantic paragraphs to be set up on the basis of the posited phonological groupings--and such we wish to do barring overriding semantic pressures to the contrary--then we may choose to view Sentence 7 as having primary semantic linkage with what is narrated in the second paragraph, its linkage with the first paragraph being viewed as secondary. To do this involves making the judgment that Sentence 7 recapitulates the event narrated in the first paragraph for the purpose of giving a proper setting to the event narrated in the second paragraph. Viewed as a setting, then, Sentence 7 identifies the event narrated in the second paragraph as belonging to the same discourse as that narrated in the first paragraph. On this view we may conclude, therefore, that Sentence 7's primary semantic linkage is with the paragraph in which it falls phonologically. In so doing, we define 'linkage' as including the notion of logical function. That is to say 'linkage' is not here to be viewed primarily as the degree to which Sentence 7 refers to what is narrated in Sentences 1-2-3-4-5-6.

2. Indeterminacy of Boundaries of Semantic Groupings.

Alternatively, some may not wish to allow the phonological breaks to dictate, in general, what the semantic boundaries between paragraphs will be. The semantic boundary, assuming there is one, between the first and second phonological paragraphs may appear to them to be indeterminate. This view relates to an assumption of the possibility of the indeterminacy of borders between units which themselves may have determinate nuclei. That is, it is possible for a text to be analyzed as having a certain number of semantic paragraphs, even though from semantic considerations alone the borders are subject to debate.

3. Semantic Relations and Their Importance for Positing Semantic Groupings.

In attempting to show semantic groupings we have relied more or less completely on our ability to state explicitly what the semantic relations are between any two juxtaposed parts of the text. The notion 'parts of the text' is important. It is not always possible to specify just what semantic relation exists between a given pair of juxtaposed sentences. Rather, we find quite often that a given sentence relates semantically to a juxtaposed sequence of sentences taken as a whole. Thus, in the sample text Sentence 1 does not relate semantically in any specifiable way to Sentence 2. Rather, it relates to the sentence sequence 2-3-4-5-6 taken as a unit. See Figure 1.

It is at this point that the notion 'semantic groupings' is seen to be a function of specifiable semantic relations between parts of texts. On the one hand, our inability to specify a relation between Sentence 1 and Sentence 2 is taken to mean that the sentence-sequence 1-2 is not a semantic group that has any relevance for the semantic structure of the text. On the other hand, our ability to specify a relation between 1 and 2...-6 is taken to mean that 1...-6 is a semantic group that has relevance for the structure of the text.

4. Semantic Immediate Constituents and Paragraph Embedding.

We shall call Sentence 1 and Sentence-sequence 2...-6 (=2-3-4-5-6) immediate constituents of the first paragraph. It will be seen in what follows that the constituent 2...-6 itself has semantic immediate constituents embedded within it. With this embedding of paragraph within paragraph we find that the principles of semantic organization of the embedded paragraph are the same as the principles of semantic organization of the matrix paragraph within which it is embedded. That is to say, embedding of semantic paragraph within semantic paragraph has potentially the same kind of organization on the two levels. This in turn supports Longacre's view of paragraph materials where multiple embedding of paragraph types are both possible and frequent.⁸

5. Table of Semantic Relations Holding Between Parts of the Text.

In Figure 1 we suggest certain tentative impressions (not formally justified at this point in the analysis) concerning semantic relations between any one sentence of the text and the sentence immediately following it. In addition, we give similar preliminary judgments concerning the semantic relations between certain sentence-sequences and some other sentence or sentence-sequences. These latter choices are those which appeared to us to have some potential interest or significance--but so far as we can see, a different selection by other analysts would not prevent them from arriving at many of our same conclusions. That is, we are developing a heuristic device, not a formal decision procedure; intuitive judgments (etic guesses in heuristic procedures) at this stage cannot be avoided.

In the Figure the first column lists a sentence by number which comprises a potential constituent of a semantic relation. The second column suggests a second such potential constituent. The third column suggests a possible semantic relation between the two constituents when such a relation appears reasonable. When, however, the elements from the two columns do not seem to us to comprise a relation that is specifiable in terms of conceptual frameworks we are familiar with, we affirm that there is no relation between them, insofar as our first guess is concerned--as with all cross-cultural research such guesses are open to error.

In the latter instance, where the relation is empty, we continue to

add further sentences to the second column (or to the first column) until some specifiable semantic relation appears. It will not follow that when some such specifiable relation does finally appear that we at that point proceed to group the constituents that are linked by this relation into a unit of semantic structure (say, a paragraph). For example, the sentence-sequence 2-3 bears a specifiable relation to Sentence 1; but in terms of the semantics of the text as a whole the relation posited as existing between them is a truncated one. It is only after Sentences 4, 5, and 6 have been added to 2-3 that we have a semantic relation with Sentence 1 that meets the contextual requirements of the text. We shall call these semantically truncated relations intermediate relations and mark them in Figure 1 with an asterisk * in the third column. Relations which we have labelled as 'empty' we have indicated by writing 'none' in the third column.

The presence of these empty and intermediate relations puts some constraint on the arbitrariness of the possible selection of sentence-sequences which we investigate.

<u>Given A</u>	<u>Given B</u>	<u>Semantic relation (A to B)</u>
1	2	none
1	2-3	*identity vs. equivalence
1	2-3-4	*identity vs. equivalence
1	2-3-4-5	*identity vs. equivalence
1	2-3-4-5-6	identity vs. equivalence
2	3	*initiating speech vs. response speech
2	3-4	*initiating speech vs. response speech
2	3-4-5	*initiating speech vs. response speech
2	3-4-5-6	initiating speech vs. response speech
3	4	*statement vs. reason
3	4-5	*statement vs. reason
3	4-5-6	topic vs. development
4	5	identity vs. equivalence
4	5-6	none
4-5	6	reason vs. consequence
5	6	*reason vs. consequence
6	7	none
2-3-4-5-6	7	*event vs. summary
1-2-3-4-5-6	7	*event vs. recapitulation
1-2-3-4-5-6	7-8	setting vs. event
1-2-3-4-5-6-7	8	setting vs. event
7	8	setting vs. event
8	9	*event vs. event transition
7-8	9	*event vs. event transition
1-2-3-4-5-6-7-8	9	*event vs. event transition
9	10	*foreshadowing vs. event
9	10-11	*foreshadowing vs. event
9	10-11-12	*foreshadowing vs. event
9	10-11-12-13	foreshadowing vs. event

10	11	*initiating action vs. response action (speech)
10	11-12	*initiating action vs. response action (speech)
10	11-12-13	initiating action vs. outcome
10-11	12	none
11	12	imperative vs. reason
12	13	*initiating action (speech) vs. consequence
11-12	13	initiating action (speech) vs. consequence
7-8	9...-13	*event vs. event
1...-8	9...-13	*event vs. event
7-8-9	10...-13	*event vs. event
13	14	*event vs. recapitulation
9...-13	14	*event vs. recapitulation
14	15	none
14	15-16	setting vs. event
15	16	setting vs. event
9...-13	14-15	none
9...-13	14...-16	setting vs. event
10...-13	14...-16	*setting vs. event
1...-13	14...-16	*event sequence vs. corollary event
1...-8	9...-16	setting vs. event

Figure 1. Table of Semantic Relations.

Two Dimensional Array. The relations posited in the Figure between Sentence-sequence 1...-6 and Sentence-sequence 7-8 and between sequences 9...-13 and 14...-16 can be viewed as giving the following structure, charted here in a two dimensional array.⁹

	EVENT-1	EVENT-2
SETTING OR PRE-EVENT	Parents' Quarrel (1...-6)	Mankhu Leaves School (9...-13)
POST-EVENT	Mankhu Goes to School (7-8)	Mankhu Travels Widely (14...-16)

Figure 2. Four-Cell Display.

Each column represents an event--and that event is broken down into a sequence of two sub-events, chronologically. The rows are not chronologically arranged but refer respectively to an introductory phase (or setting) of the event and to a resultant relation of that pre-event to the post-event. The first event begins with a quarrel between the parents, and this forms the setting for the end of the event, i.e. Mankhu's schooling. The second event is set up by the boy's leaving school and results in his traveling widely.

Each of the four cells, resulting from the intersection of the two event sequences with their respective pre and post components, can be seen as a semantic paragraph. Thus, sentence-sequences 1...-6, 7-8, 9...-13 and 14...-16 are semantic paragraphs paralleling the phonological paragraphs discussed in Section D.

Two-Cell Diagram. The relation posited in Figure 1 between sentence-sequences 1...-8 and 9...-16 gives us a different diagram--a two-cell diagram which reflects the fact that two semantic components are involved instead of four. Figure 3, then, shows the semantics of the story at a higher level of discourse structure than Figure 2.

	SETTING	EVENT
NARRATIVE DISCOURSE	Mankhu Goes to School (1...-8)	Mankhu Leaves School and Travels Widely (9...-16)

Figure 3. Two-Cell Display.

Combining the Diagrams. Combining the structures posited in the two Figures we arrive at the following formula representing high-level semantic groupings: ((1 2 3 4 5 6) (7 8)) ((9 10 11 12 13) (14 15 16)). That is, at the highest level, there are two constituents: the setting comprised of sentence-sequence 1...-8 and the event comprised of sentence-sequence 9...-16. Embedded in the setting are two semantic paragraphs: a setting comprised of 1...-6 and an event comprised of 7-8. Similarly, embedded in the event are two paragraphs: a setting comprised of 9...-13 and an event comprised of 14...-16.

Setting vs. Event. The relation posited between sentence-sequences 7-8 and 9...-13, between 1...-8 and 9...-13, between 7...-9 and 10...-13, and between 1...-13 and 14...-16, is that of EVENT vs. EVENT (in the case of 1...-13 and 14...-16, EVENT SEQUENCE vs. COROLLARY EVENT). We have labelled the relation between these various sentence-groups as EVENT vs. EVENT because the focus of the intended narration concerning "what happened" is more or less equally present in each event sequence. With SETTING vs. EVENT, on the contrary, the focus of the intended narration is not on one event followed by another of equal interest, as beads on the same event chain. Rather, with SETTING vs. EVENT (as in 1...-6 vs. 7-8), the narrator's intent is basically to record one focal event (7-8), while other materials (1...-6) are added as background for understanding the time, place or attendant circumstances of that event. This is to say, settings are semantically peripheral. Events are semantically nuclear.

Other Instances of Setting vs. Event. From Figure 1 other instances of the SETTING vs. EVENT relation are observed, viz., between 7 and 8, between 14 and 15-16, and between 15 and 16. These instances occur at a lower level of narrative structure than those discussed in E.5 under the paragraph headings Two Dimensional Array and Two-Cell Diagram. Sentences 7, 14, and 15 are semantic immediate constituents respectively of paragraphs 7-8, 14...-16, and 15-16 (the latter being embedded within 14...-16). Settings, therefore, occur within as well as across boundaries of matrix paragraphs in this particular text.

The question arises: Is Sentence 9, which we characterize semantically as foreshadowing the event narrated in 10...-13, parallel to sentences characterized as settings, viz., 7, 14, and 15? Our tentative answer is that the foreshadowing itself appears to be a kind of setting and that we find it difficult to draw a sharp line between foreshadowing as setting and recapitulation as setting. Perhaps they are semantic variants of some underlying semantic unity. That is, the setting part of a new paragraph may be semantically either a summary of the preceding paragraph or a preview of the event recorded in the paragraph which it begins. Sometimes the two seem to be combined: Compare, for example, the first part of 9 ('He studied and studied...'), which relates backward to his going to school, with the second part ('...into the sixth class he studied...'), which by implication refers to the time when he left school (after having reached the sixth grade). We therefore choose to treat the foreshadowing relation as a variant of what is basically a setting for the event narrated in 10...-13.

With this discussion in mind we take another look at the relation we posited between sentence-sequences 1...-8 and 9...-16 to see if our initial semantic guess was correct. Initially, we labelled the relation between them as SETTING vs. EVENT. But unlike other setting constituents, 1...-8 does not recapitulate a preceding event or event-sequence. That is, the narrator does not give us any information antecedent to 1...-8 which 1...-8 then recapitulates as a setting for the ensuing event. Moreover, 1...-8 does not seem to foreshadow or preview

what follows in 9...-16. In other words, the highest-level setting in the text--the setting for the focal event of this particular narrative taken as a whole--does not have the same properties as paragraph level settings. We conclude, tentatively, that recapitulation and foreshadowing are features characterizing inter-paragraph linkage and that such features need not characterize inter-discourse linkage in Dhangar. To put it another way, a Dhangar narrative discourse is identifiable as such without the kind of backward and forward references that narrative paragraphs frequently exhibit in order to identify them as paragraphs within a discourse.

Formulas for Intra-Paragraph Groupings. Embedded in the four major semantic groupings we posited in E.5 under the paragraph heading Two Dimensional Array are various sub groupings the boundaries of which we delimit via the semantic relations posited in Figure 1, as follows:

Formula for the first major semantic group:

(1 (2 (3 ((4-5) 6))))

That is, 4-5 is embedded semantically in 4...-6, then 4...-6 is embedded in 3...-6, then 3...-6 in 2...-6, and finally 2...-6 in 1...-6. But a problem of interpretation arises. In Figure 1 it is seen that 3 can be related to 4...-6. Query: is 6 to be related as an IC (Immediate constituent) with 4-5 (whereupon 4...-6 is related to 3), or is 4-5 first to be related to 3 and then 3...-5 to be related as an IC with 6? Our answer: if 6 were not present in the text, the relation of 3 to 4-5 would be that of immediate constituents of an embedded paragraph. But, in fact, 6 does occur, and a very close semantic link between it and 4-5 is clearly shown on two counts--the semantic REASON vs. CONSEQUENCE link, and a very tight formal link by particle sequence glossed as 'therefore' (see mala too in the Dhangar). For these reasons we consider 3 to be linked in an IC relation with 4...-6 rather than 6 linked in an IC relation to 3...-5.

Similar kinds of arguments affect judgments throughout. These kinds of considerations lead to our emic reworking of the preliminary possibilities given in Figure 1.

In this first group then, a quarrel is announced (1) and the quarrel is described (2...-6) in which the father speaks (2) and then the mother speaks (3...-6) with her opening statement (3) followed by the development of her argument (4...-6): her reasoning (4-5) and its logical consequence (6).

Formula for the second major semantic group:

(7-8)

That is, 7 pairs off semantically with 8 at the same level of structure. There is no embedding. Sentence 7 recapitulates the event narrated in 1...-6 in order to give the proper setting for the event narrated in Sentence 8.

Formula for the third major semantic group:

$$(9 (10 ((11-12) 13)))$$

That is, 11-12 is embedded in 11...-13, then 11...-13 is embedded in 10...-13. Finally, 10...-13 is embedded in 9...-13. In 9 we are given continuity with the preceding paragraph and a preview of what is to come in 10...-13. In 10 Mankhu initiates an action the outcome of which (11...-13) is seen in his finally leaving school (13) after commanded to do so by his father (11-12).¹⁰

Formula for the fourth major semantic group:

$$(14 ((15) 16))$$

That is, 15 is embedded in 15-16 and 15-16 is embedded in 14...-16. Sentence 14 recapitulates 9...-13 to give proper setting to the event narrated in 15-16.¹¹ Sentence 15 then recapitulates 1...-8 in general and 9 in particular (the latter having an explicit backward reference to 7-8) in order to give the setting for 16.

Tree Representing Semantic Structure of the Sample Text. The following tree diagram represents our emic re-working of the preliminary semantics posited in Figure 1—it is also representative of our emic re-working of the results of sentence reversal in Section F, though the labels for the nodes are semantic labels, not grammatical.

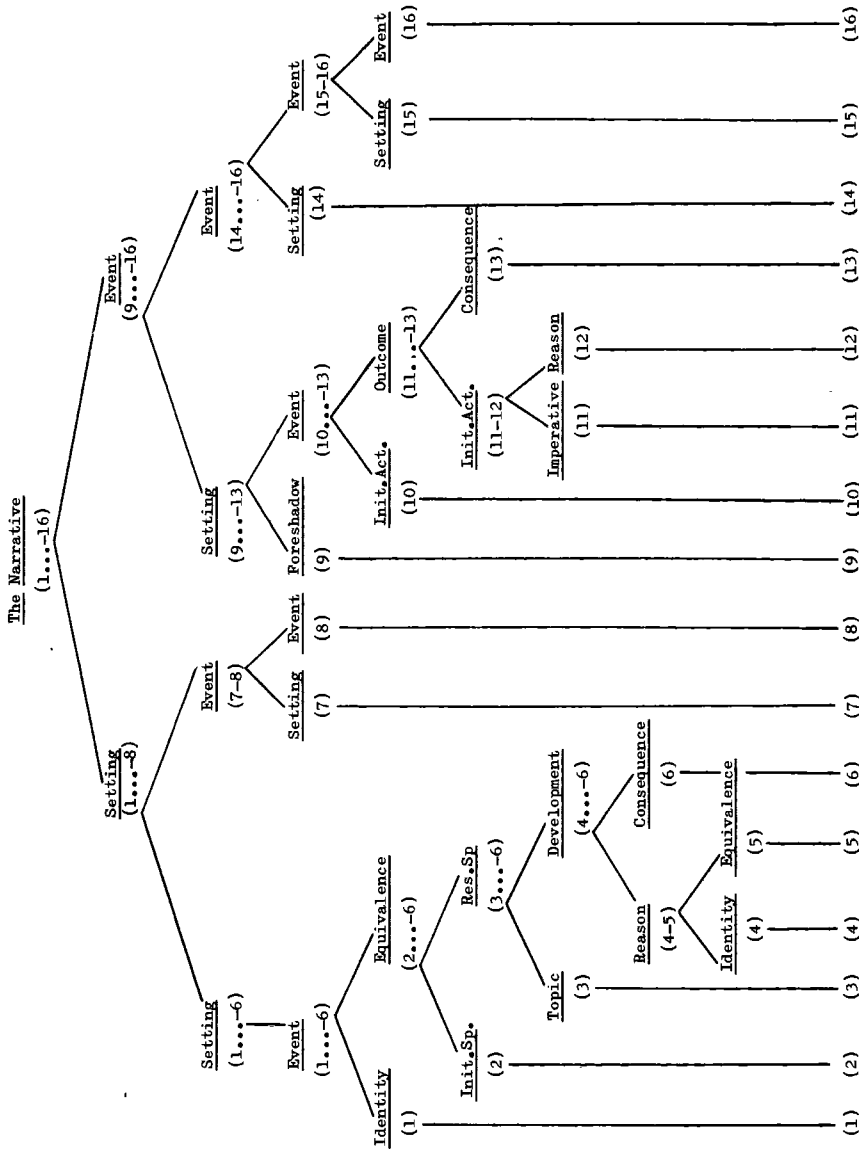


Figure 4. Tree Structure of Sample Text.

F. Grammatical Groupings.

In this section we discuss, first of all, the general usefulness of sentence-reversal as a tool for discourse analysis (F.1), after which we exhibit via Figure 5 the specific reversals which our language assistants allowed (F.2). We then proceed to discuss the relation of our sentence-reversal material to the semantic material of Section E.5 attempting to show how certain reversals were blocked because of co-occurring semantic constraints. Here also we present formulas for intra-paragraph sub groupings on the basis of our table of reversals (F.3).

1. Sentence Reversal as a Tool for Discourse Analysis.

We view the usefulness of sentence reversal as a tool for grammatical analysis of high level structures as directly related to the observable and testable fact that, given a coherent text or story, not all of its sentences or sentence-sequences are equally reversible. We assume, that is, that differences in reversibility among parts of texts correlate with differences in grammatical structure. (By grammatical structure we mean combined grammatical and semantic structure. This is in keeping with a basic assumption of Tagmemic theory to the effect that grammatical structure is a composite of form and meaning.)

We illustrate these differences in reversibility and in grammatical structure from our sample text: In the first major grouping, 1...-6, we find it very difficult to readjust the grammar of Sentence 2 (father's speech) and Sentence 3 (beginning of mother's response) in any fashion which allows the mother's speech to begin (3), the father's then to be given (2), and the mother's finally to be given in its remaining parts (4...-6). There is, then, a resistance to the splitting or interruption of this kind of chronological-logical sequence (3...-6) via sentence reversal because of the very close-knit grammatical and semantic unity or coherence among its parts. But, we encounter no apparent resistance when we attempt to interrupt the original sentence-sequence 5-6 by reversing Sentence 4 with Sentence 5 (getting 5-4-6). This is so because the semantic unity or coherence existing between 5 and 6 is not upset when 4 is allowed to interrupt it. Sentences 4 and 5 both narrate the mother's reason (in an IDENTITY-EQUIVALENCE relation) for concluding in 6 that Mankhu should not go to school. That is to say, 4 and 5 are more united to each other than either of them is to 6. This means that there is no close-knit unity or coherence between 5 and 6 which, when interrupted by 4, is violated. To the contrary, the close-knit unity lies between 4 and 5, and is so tight that 6 is not allowed to interrupt it.

We conclude from this illustration that sentence reversal proved useful in showing that the grammatical structure of 3...-6 in relation to 2 is different from that of 5-6 in relation to 4. But sentence reversal did more than show that their structures were different; it implied what their structures would actually look like if we tried to

map them on to a tree diagram (Figure 4), or give formulas for them similar to those we gave for the semantic materials in Section E. Sentence reversal as applied to the first six sentences of the text, for example, implied that Sentence 2 and Sentence-sequence 3...-6 are ICs at the same level within the larger structure 1...-6. That is, as Figure 5 shows, 1 reverses with 2...-6 taken as a whole, but not with 2. (If the latter reversal were possible then we would conclude that 1 and 2 were ICs at the same level of embedding.) Proceeding just this far with the reversals we are able to give a formula for the structure of 1...-6 as (1 ((2) (3...-6))) : Sentence 2 pairs off at the same level of structure as 3...-6, and taken together they embed within the major paragraph 1...-6. See Section F.3 for formulas of major paragraphs.

We do not wish to imply from the preceding discussion that sentence reversal may be considered as a mechanical discovery procedure which guarantees automatically correct results. The contrast implied is not between reversals which are absolutely acceptable versus reversals which are absolutely rejected. Rather the contrast seems to be between easy reversibility and difficult reversibility, and we will have to grant at the present stage of our research that the terms "easy" and "difficult" are left undefined.

Yet the fact that the scale of reversibility has indeterminate boundaries by no means changes the fact that as a heuristic it can most certainly lead to a preliminary hypothesis--a hypothesis which must be checked against other formal criteria (which are not under consideration here) in order to show that the internal consistency of the posited system is well represented by it.

Our preliminary hypothesis--to repeat by way of summary--is that sentence reversal as a heuristic procedure does give some experimental support to the assumption that different degrees of resistance to the interruption of two sentences or sentence-sequences is likely to suggest that there are different degrees of coherence or unity between their parts; and further, that these different degrees of resistance to interruption, when tabulated for a whole text, are convertible into preliminary structural descriptions of that text's discourse and paragraph grammar. But in accomplishing the latter we make parallel use of tabulated semantic information (Section E.5).

2. Table of Reversals. In Figure 5, the first column lists a sentence or sentence-sequence by number that comprises a potential constituent of a paired-sentence reversal. The second column lists a second such potential constituent. The third column lists the resulting combinations (orderings) of our attempts to reverse constituents from the first and second columns. If no reversal is permitted we list only the unreversed (original) combination. If a reversal is permitted which is clearly intermediate (i.e., it is eventually blocked when further sentences are added to the second column) we mark it with an asterisk *. Not all possible reversals for the text have been attempted. Our choices

330 Patterns in Clause, Sentence, and Discourse

were those which appeared to us to have some potential interest or significance.

<u>Given A</u>	<u>Given B</u>	<u>Result of reversing A with B</u>
1	2	1-2 (i.e., none allowed)
1-2	3	1-2-3/*2-3-1
1-2-3/*2-3-1	4	1-2-3-4/2-3-4-1/*1-2-4-3/*2-4-3-1
1-2-3-4/2-3-4-1/etc.	5	1-2-3-4-5/*2-3-4-5-1/*1-2-4-5-3/ *2-4-5-3-1/1-2-3-5-4/*2-3-5-4-1/ *1-2-5-4-3/*2-5-4-3-1
('etc.' here means 'in addition to all forms in the third column of the immediately preceding row.')		
1-2-3-4-5/etc.	6	1-2-3-4-5-6/2-3-4-5-6-1/1-2-3-5-4-6/ 2-3-5-4-6-1
1-2-3-4-5-6/etc.	7	1-2-3-4-5-6-7/1-2-3-5-4-6-7
1-2-3-4-5-6-7/etc.	8	1-2-3-4-5-6-7-8/1-2-3-5-4-6-7-8/ 2-3-4-5-6-1-7-8/2-3-5-4-6-1-7-8/ 8-1-2-3-4-5-6-7-8/8-1-2-3-5-4-6-7-8
1-2-3-4-5-6-7-8/etc.	9	1-2-3-4-5-6-7-8-9/etc. ('etc.' here means 'in addition to all combinations in the third column of the immediately preceding row.')
1-2-3-4-5-6-7-8-9/etc.	10	1-2-3-4-5-6-7-8-9-10/etc.
1-2-3-4-5-6-7-8-9-10/etc.	11	1-2-3-4-5-6-7-8-9-10-11/etc.
1-2-3-4-5-6-7-8-9-10-11/etc.	12	1-2-3-4-5-6-7-8-9-10-11-12/etc./ 1-2-3-4-5-6-7-8-9-10-12-11/etc.
1-2-3-4-5-6-7-8-9-10-11-12/etc.	13	1-2-3-4-5-6-7-8-9-10-11-12-13/etc.
1-2-3-4-5-6-7-8-9-10-11-12-13/etc.	14	1-2-3-4-5-6-7-8-9-10-11-12-13-14/ etc.

<u>Given A</u>	<u>Given B</u>	<u>Result of reversing A with B</u>
1-2-3-4-5-6-7-8-9-10- 11-12-13-14/etc.	15	1-2-3-4-5-6-7-8-9-10-11-12-13-14- 15/etc.
1-2-3-4-5-6-7-8-9-10- 11-12-13-14-15/etc.	16	1-2-3-4-5-6-7-8-9-10-11-12-13-14- 15-16/etc./1-2-3-4-5-6-7-8-15-16- 9-10-11-12-13-14-15-16/etc./16-9- 10-11-12-13-14-15-16-1-2-3-4-5-6- 7-8-14-15-16/etc.

Figure 5. Table of Sentence Reversals.

3. Comparison of Tabulated Reversals (Figure 5) and Semantic Relations (Figure 1).

Relation of Reversibility to the Distinction Between 'Nuclear' and Peripheral. From Figure 5 we observe that Sentence 1 reverses easily with contiguous sentence-sequences such as 2-3, 2-3-4, etc. Sentences 7, 9, and 14, however, do not easily reverse with contiguous sentences or sentence-sequences. Similarly, Sentence 15 does not reverse with contiguous sentences or sentence-sequences. Now looking at Figure 1 we see, on the one hand, that sentences 7, 9, 14, and 15 have been described as settings, and on the other hand, that Sentence-1 has been described as a non-setting (i.e., it relates to 2...-6 as IDENTITY to EQUIVALENCE). Settings are semantically peripheral; non-settings are semantically nuclear. We feel that our use of 'peripheral' and 'nuclear' as contrasting terms applying to elements of paragraph structure is supported by the observation here to the effect that the opening sentences of paragraphs 7-8, 9...-13, 14...-16 and 15-16 are not as easily reversible with contiguous parts of the text as the opening sentence of paragraph 1...-6 is. We conclude that a pair of nuclear items reverses more easily than a pair of sentences one of which is peripheral and one nuclear.

Semantic Constraints Governing Difference of Reversibility Among Intra-Paragraph Nuclear ICs. We said in Section F.1 that the usefulness of sentence reversal as a research tool was related to the fact that not all sentences or sentence-sequences are equally reversible. We wish to build on to that preliminary discussion by observing from Figure 5 that reversals are allowed between some nuclear semantic ICs but not all. We ask: Are there semantic constraints which govern this difference of reversibility among nuclear ICs? (See Section E.5 under paragraph heading Formulas for Intra-Paragraph Groupings for IC analysis of semantic paragraphs.) Our answer is affirmative. By comparing the two figures we see that nuclear constituents linked semantically by solely logical relations are more easily reversed than those linked by chronological relations.

(Here the contrast is being made between constituents having logical linkage only versus those which have chronological linkage plus or minus logical linkage.)

Hence, we find that the nuclear reversible constituents 1 and 2...-6 are related logically as IDENTITY to EQUIVALENCE with no accompanying chronological link (i.e., there is logical sequence involved, but not chronological sequence). But non-reversible nuclear constituents 10 and 11...-13 are related chronologically as INITIATING ACTION to OUTCOME (or SEQUENT ACTION). Within paragraph nuclei, then, it appears easier to reverse logically related ICs than it is to reverse chronologically related ones, so far as our sample text is concerned.

Semantic Constraints Governing Difference of Reversibility Among Inter-Paragraph ICs. If the preceding holds true in general for intra-paragraph nuclear ICs, we wish to know if it holds true, also, for inter-paragraph ICs at the discourse-level. At first glance, it appears that the logical versus chronological semantic constraint does not apply. For example, Sentence 8, the nuclear constituent of the second paragraph—and chronologically sequent to the event narrated in the first paragraph—reverses with 1...-6. In this instance, however, Sentence 8, accompanied by 7, reappears at the end of the reversed sequence 8-1-2-3-4-5-6 giving 8-1-2-3-4-5-6-7-8. Hence, chronological upset of this kind or degree is accompanied by major compensating grammatical adjustment, viz. the repetition of 8 (with 7) at the end of the reversed sequence. This is an important aspect of the sentence reversal technique which we shall come back to in Section G. We conclude, tentatively, that inter-paragraph chronological reversal is not terribly difficult, so far as this text is concerned, provided the reversed constituent is repeated in normal chronological sequence after the reversed sequence. Unfortunately, this particular text has no inter-paragraph links that are merely logical and, therefore, we are not able to say conclusively that logically related constituents reverse more easily than chronologically related ones. We assume that logically related constituents reverse more easily than chronological ones in terms of economy of accompanying grammatical adjustments—the adjustments accompanying logical reversals will be more economical. See Section G.

Discourse-Level Grammatical Boundaries. One particular reversal more than others which our language assistants allowed gives us an insight into the structure of this narrative's highest-level grammar. That is the reversal which gives us the combination 16-9-10-11-12-13-14-15-16-1-2-3-4-5-6-7-8-14-15-16. We interpret the embedding, via major chronological reversal, of 9...-16 within 16-9-10-11-12-13-14-15-16 taken together with the embedding of 1...-8 within 1-2-3-4-5-6-7-8-14-15-16 as indicating that we have two major discourse-level constituents for this text: 1...-8 and 9...-16. There seems to be no way that we can split either of these sentence-sequences (1...-8 or 9...-16) via further reversal. But we can split the original sequence of the narrative by re-

versing these two, the one with the other. That we can make this particular high-level reversal but not others is taken here to mean that we have a grammatical structure for the narrative paralleling that posited via our paired semantic components approach (Figure 1) where we said that 1...-8 related semantically to 9...-16 as SETTING to EVENT. See also Figure 3.

Paragraph Boundaries. The placing of grammatical boundaries parallel to those we posited for the semantic and phonological paragraphs is supported by the sentence reversal tabulation (Figure 5). Specifically, the permitted reversal by which we get 2-3-4-5-6-1-7-8 supports the placing of the boundary of the first grammatical paragraph between Sentence 6 and Sentence 7. Sentence 7's supposed indeterminacy as to paragraph membership (See Section E.2) is reduced considerably when we consider its juxtaposition, via the reversal, to Sentence 1--particularly since we would have expected 7 to disappear, rather than to appear juxtaposed to 1, if it had belonged to the first paragraph. That is to say, Sentence 7, which has the same grammar as reversed Sentence 1 (see Section G), would be grammatically redundant if its membership was with the first paragraph. Its proposed membership in the second paragraph keeps us clear of such redundancy.

Placing the grammatical boundary for the second paragraph between 8 and 9 is supported by the permitted reversal 1-2-3-4-5-6-7-8-15-16-9-10-11-12-13-14-15-16 in which the sequence 15-16, a constituent from the fourth paragraph, comes between 8 and 9. To say that 8 and 9 belong to the same paragraph means that 15-16 must also belong to that paragraph, via the reversal--and that is difficult to sustain in view of 15-16's consistent co-occurrence with 14 (as in the end of the above reversal). In addition, we note 14-15-16's consistent co-occurrence with 9...-13, as above, and under reversal such as in the permitted combination 16-9-10-11-12-13-14-15-16-1-2-3-4-5-6-7-8-14-15-16.

For the third and fourth paragraphs the placing of the boundary between 13 and 14 is supported by the reversal cited immediately above, in which the last instance of 14 does not occur contiguous to 13 but to 8. This is not very conclusive evidence for positing a grammatical boundary between 13 and 14. If we found that we could reverse the larger sequence 9...-13 with 14...-16 giving *14-15-16-9-10-11-12-13 we would thereby have stronger evidence for placing the boundary between 13 and 14. However, this particular reversal has not yet been attempted.

We conclude that sentence reversal in general supports the division of the text into four grammatical paragraphs: 1...-6, 7-8, 9...-13, and 14...-16. This agrees with our earlier divisions of the text on the basis of the phonology and semantics. Compare with Figure 4.

Formulas for Intra-Paragraph Groupings. Embedded in the major paragraphs which we set up in Sections D and E.5 are various sub group-

ings the boundaries of which we attempt to delimit here via the reversals in Figure 5—in our formulas, all sentences of a paragraph which are connected by hyphen are nuclear; in cases where paired sentences are not so connected the first such sentence is peripheral, the second nuclear.

Formula for the first paragraph:

$$(1-(2-(3-((4-5)-6))))$$

Beginning at the deepest level of embedding and working up and out, we note, first, that 4-5 does not get interrupted, via reversal, by either 3 or 6. But both 3 and 6, provided one or the other is not counted as present in the text, may reverse with 4-5 taken together—we have not shown, via Figure 5, 6 reversing with 4-5 since, there, we were not concerned to show reversals involving deletion of sentences which had already been added in the second column. Hence, we place parentheses around 4-5 to indicate that taken as a whole it pairs off with another constituent to form an embedded paragraph. In our formula we have shown 4-5-6 as that embedded paragraph, and in doing so we have not relied on sentence reversal but on the close grammatical link between 4-5 and 6 via the particle sequence see mala too, the Dhangar equivalent of 'therefore.' By way of this close link with 4-5, Sentence 6 and 4-5 form together a constituent that as a unit may be linked semantically to Sentence 3; hence, we have drawn parentheses around 3-4-5-6 to indicate that it forms the next ascending level of embedding. At this point then our formula is derived not only from the results of sentence reversal but from the results of our semantic analysis in Section E.

Our parentheses around 3-4-5-6 reflects the fact that 2 does not interrupt that sequence at any point (i.e., does not reverse with any part of 3-4-5-6). It follows that 2 is grammatically related to 3-4-5-6 as a whole and not to any part of it in isolation from the rest—this is confirmed by the overt grammar that connects 3-4-5-6 with 2, viz., the direct quote marker at the beginning of 3 which embraces 3-4-5-6 as a unit. Finally, 2-3-4-5-6, because it cannot be interrupted by Sentence 1, is contained within parentheses. Sentence 1 and sentence-sequence 2...-6 pair off at the same level to form the immediate constituents of the first matrix paragraph of the text.

Formula for the second paragraph:

$$(7 \ 8)$$

There is no embedding within this paragraph. Sentence 7 does not reverse with Sentence 8. That 7 is, however, peripheral to 8 is seen via the permitted reversal 8-1-2-3-4-5-6-7-8 in which 8 may occur initially in the text without being accompanied by 7. Hence, we have not used a hyphen in the formula for this paragraph. This contrasts with our use of the hyphen in the first paragraph to indicate that Sentence 1, because it does reverse with 2...-6 and because it does not appear to be deletable, is nuclear, as well as 2...-6—we note that peripheral ele-

ments such as paragraph settings (Sentences 7, 14, and 15) are deletable upon major chronological reversal. See Figure 5.

Formula for the third paragraph:

$$(9 (10-((11-12)-13)))$$

This formula is similar to that for the first paragraph except that the latter contained one more constituent and, thus, one more level of embedding than this paragraph. It differs also in that 9 is peripheral to 10...-13, unlike the first paragraph in which 1 is nuclear as well as 2...-6. This difference is not demonstrated by any reversal we have attempted thus far; so at this point we are relying on the semantics of Section E.5.

Sentence-sequence 11-12 is not interrupted by either 10 or 13. It forms a unit constituent that pairs off with some other constituent to form an embedded paragraph. In this case 11-12 pairs off with sentence 13, the grammatical relation between them being overtly marked by the Dhangar particle see translatable by English 'so.' Then, 11-12-13 pairs off with 10 with the accompanying grammatical link marked by Dhangar huN translatable by English 'also.' We rely pretty much on the semantics for this particular pairing of ICs. Finally, Sentence 9 pairs off with 10-11-12-13 linked as they are by Dhangar tekar-baad-nu translatable by English 'after this.' The 'after this' begins a sequence inclusive of 10 through 13.

Formula for the fourth paragraph:

$$(14 (15 16))$$

From Figure 5 we note that in the resulting combinations of the major chronological reversals, 15-16 occurs once without being accompanied by 14 (15-16-9-10-11-12-13-14-15-16), and that 16 occurs once without being accompanied by 15 (16-9-10-11-12-13-14-15-16-1-2-3-4-5-6-7-8-14-15-16). This kind of behavior we have interpreted above as indicating a distinction between peripheral and nuclear paragraph constituents. In the first instance, 15 is a peripheral constituent (semantically, a setting) that pairs off with 16, the nucleus, to form an embedded constituent that in turn pairs off with 14 to form the primary ICs of the matrix paragraph. In the second instance, 14 is a peripheral constituent (semantically, a setting) that pairs off with 15-16, the nucleus of the matrix paragraph. We have indicated the peripheral status of these constituents in the formula by not hyphenating between 14 and 15-16 nor between 15 and 16.

In this section we have tried to show that our tool of sentence reversal yields results that are convertible into preliminary structural descriptions of inter-paragraph and intra-paragraph grammar. That we have not succeeded in doing so without cross-reference to the results of our approach to paired semantic components (Section E) underscores one of

our basic assumptions which we repeat here: Grammatical structure is a composite of form and meaning. We have not been able to rely solely on one approach as over against the other in setting up our formulas. We have had to combine both kinds of approach and both kinds of results.

The general principle underlying our use of sentence reversal results as a means of formulating preliminary structural descriptions is that different degrees of resistance to the interruption of a given sentence-sequence via reversal enable the analyst to delimit the grammatical boundaries between immediate constituents of the text at a particular level of embedding and, that given sufficient information of the types displayed in Figures 1 and 5, the analyst is able to do this systematically for the text as a whole and for all levels of embedding. We have applied the reversal technique to only one text for one language. We are confident that this technique will be equally useful in applications to other Dhangar texts and to texts of languages other than Dhangar.

G. Hypothesis to Account for Semantic Upset in Relation to the Grammatical Adjustments Forced by our Tool of Sentence Reversal.

We wish to propose a hypothesis which will explain the phenomenon of chronological upset as we encountered it in Section F.3, under the paragraph heading Semantic Constraints Governing Difference of Reversibility etc., and which will delimit for us the boundaries of its occurrence in terms of a scale of greater versus lesser upset. (This relates to the preliminary discussion in Section B.3 regarding change of focus in attention and re-focussed paraphrases of a discourse. Here, we are attempting to grapple with the question: What are the limits of focus change?) We wish such a hypothesis to be able to cover instances of logical as well as chronological upset—we are not, however, trying to contrast logical versus chronological upset in an absolute sense; in many instances they overlap. In general, therefore, we wish our hypothesis to handle all varieties of semantic upset. At this stage of our research, however, our hypothesis and the testing of its worth will be tentative, preliminary, and sketchy.

1. Hypothesis. Our hypothesis will be that the greater the semantic upset the more uneconomical or complex will be the accompanying adjusted grammar. Corollary judgments spawned by this hypothesis are 1. that the greater the semantic upset (as this has been evaluated by the narrator's audience, and then communicated to him) the more costly will be the narrator's attempt to remedy the upset in terms of narrative energy. And 2. that the greater the semantic upset the greater will be the hearer's expenditure of perceptual or cognitive energy (the energy expended in order to understand what the speaker is narrating).¹²

2. Assumption Regarding Complex and Simple Grammar Underlying Hypothesis.

One assumption underlying our hypothesis is that we may formally distinguish between complex and simple grammar, and beyond this that we may distinguish between various degrees of grammatical complexity (and, consequently, between various degrees of grammatical simplicity).

At present, we can only begin to support this assumption. We have an example of simple grammar in the first paragraph of our sample text:

(A) 1. One day Mankhu's mother and father had a fight. 2. His father said, 3. His mother said, . . . , etc.

In this sentence-sequence the logical transition between Sentence 1 and what follows is carried by simple juxtaposition, which is to say that the transition need not be marked by means of overt grammatical particles. But when we reverse sentence 1 with what follows the grammar is less simple:

(B) 2. One day Mankhu's father said, 3. His mother said, . . . ,etc. 1. In just that manner, back and forth, they quarreled between themselves.

The logical transition between sentence-sequence 2-3, etc. and Sentence 1 can no longer be carried by simple juxtaposition; it must be carried by overt grammatical markers 'In just that manner' and 'back and forth.' Hence, sentence reversal gives us a device for distinguishing various degrees of grammatical simplicity and complexity. We shall say, then, that the greater the need for grammatically marked transition between parts of texts, the greater the grammatical complexity of the text as a whole.

3. Semantic Upsets and Consequent Grammatical Adjustments. Our hypothesis regarding semantic upset was that the greater the upset the greater will be the complexity of the grammar which seeks to remedy that upset. (Perhaps we should speak of 'would-be' semantic upset instead of 'actual' upset since the narrator usually does not allow the upset to actually or finally occur. Hence, we are interested in the grammar which he uses in order to block such upsets.) And this we wish to discuss briefly with illustrations from our sample text.

Minimal Semantic Upset. On the lower extreme of the scale of upset no grammatical adjustments will be required in order to compensate for semantic skewing. It may even be difficult to say in such instances that one form of the text is more upset than another. For example, Sentence 4 and Sentence 5 of the original

(A) 4. Who will do the work around here? 5. Who will do the farming and gardening?

are simply juxtaposed with no overt grammatical particle marking the

transition between them. When we reverse these sentences, we get

(B) 5. Who will do the farming and gardening? 4. Who will do the work around here?

again with simple juxtaposition, i. e., no overt marking of the transition. As far as the English translation is concerned we may feel that the reversed version (B) is not semantically as acceptable as version (A). At any rate, no grammatical adjustment is required by our main language assistant for the Dhangar reversal. We may judge, however, that he would normally say (A) in preference to (B), and from this consideration conclude that (A) is less semantically upset than (B). In so judging we would then need to search for contexts in which sentences like 4 do not reverse with sentences like 5 apart from some grammatical adjustment.

Maximum Semantic Upset. On the upper extreme of the scale certain kinds of semantic upset may be judged to have taken place which no amount of grammatical adjustment can remedy--short of recasting the whole narration, or that part of it affected by the upset. In such instances, the requisite grammatical adjustment amounts to making such amended narrations. We illustrate from our text:

(A) 2. One day Mankhu's father said, "Hey, Mankhu, go to school and study." 3. His mother said, "No, he will not go. . .4-5-6." 1. In just that manner, back and forth, they quarreled between themselves. 7. (optionally occurring) In that manner they quarreled. 8. At any rate, Mankhu disregarded his mother's word and went off to school to study.

*(B) 8. One day, Mankhu disregarded his mother's word and went off to school to study. 2. His father said, on that particular day, "Hey, Mankhu, go to school and study." 3. His mother said, "No, he will not go. . .4-5-6." 1. In just that manner, back and forth, they quarreled between themselves. 7. (optionally occurring) In that manner they quarreled. 8. And Mankhu, having disregarded his mother's word, went off to school to study.

Version (A) is a result of what we call primary reversal, that is reversal between intra-paragraph constituents. We have discussed this particular reversal above. Version (B) is a result of secondary reversal, that is reversal between inter-paragraph constituents.¹³ We have marked (B) with an asterisk to indicate that the Dhangar equivalent of (B) is not acceptable to our language helper. He tells us that the secondary reversal in (B) is all right, but that the previously acceptable primary reversal between 1 and 2...-6 is not acceptable in (B). Version (C), in which the secondary reversal of (B) is retained, but the primary reversal rejected, is the acceptable alternative to (A):

(C) 8. One day, Mankhu disregarded his mother's word and went off to school to study. 1. It happened in this way: That day Mankhu's

mother and father had an argument. 2. His father said, "Hey, Mankhu, go to school and study." 3. His mother said, "No, he will not go. . . 4-5-6." 7. In just that manner, back and forth, they quarreled between themselves. 8. And, having disregarded his mother's word, he went off to school to study.

Version (B), then, is an instance of maximum or near-maximum semantic upset. If (B) was ever actually to occur, then presumably much of its content would be recast in a form similar to (C), or to (A). This assumes that our language assistant's reluctance to accept version (B) was due to the fact that he could think of no grammatical adjustment which would remedy the semantic upset short of such recasting. Of course, it may turn out that he will eventually find a way to keep (B) by making some less costly grammatical adjustments; in that case we would have to revise our evaluation of this particular instance of semantic upset.

Intermediate Semantic Upset. In between these two extremes on the scale of semantic upset we get some upsets that are on the lower half which are remedied by means of relatively economical or simple adjustments--such as the upset caused by reversing 1 with 2...-6 (which we have discussed above); and we get some upsets that are on the upper half of the scale that are remedied by means of relatively uneconomical or complex adjustments. We illustrate these upper-half upsets via the major chronological reversals, viz., 8-1-2-3-4-5-6-7-8, 1-2-3-4-5-6-7-8-15-16-9-10-11-12-13-14-15-16 and 16-9-10-11-12-13-14-15-16-1-2-3-4-5-6-7-8-14-15-16. The upset caused by reversing the original 'this-happened,-then-that-happened' chronology is so great that the addition of special transition grammatical markers between reversed constituents is not sufficient to remedy the upset or preserve the original intended meaning; the reversed constituents such as 8, 15-16 and 16 must be repeated in their original chronology-preserving positions--relatively uneconomical as grammatical adjustments go. Moreover, of these three chronological reversals, the one involving the placing of 16 at the beginning of the text is relatively more costly than the other two, since it seems to require the repetition of 16 twice, whereas 8 and 15-16 are each repeated only once.

4. Preliminary Assessment of the Hypothesis.

In this discussion we have attempted to test our hypothesis in a preliminary way. We feel that the hypothesis works well so far as our sample text is concerned. It may need refinement as we attempt to apply it to other Dhangar texts. We have made no attempt to assign specific measurements to various types of semantic upset or to various types of accompanying adjusted grammar along the scale of upset which we posited. Hence, we do not wish to be taken too literally when we discussed the 'lower half' versus the 'upper half' of the scale. Nevertheless, we feel confident that our assignments of the various types along the scale relative to each other will be upheld by further investigation.

H. Summary.

The observation that not all paired sentences or sentence-sequences of a narrative text are equally reversible taken in conjunction with the observation that not all paired sentences or sentence-sequences of a narrative text sustain semantic relations among themselves that are equally specifiable leads us to say that making systematic tabulations of acceptable versus unacceptable reversals and of semantically specifiable versus semantically non-specifiable relations is very useful for the purpose of describing the structure of one Dhangar narrative discourse. Further, sentence reversal, by virtue of the semantic constraint we put upon it—requiring that the logical and chronological relations of the original narration be preserved throughout—has the added usefulness that it helps us distinguish formally between various degrees of semantic upset or skewing. This it does by forcing compensating grammatical adjustments which vary in complexity according to the degree of upset which occurred as a result of the reversal.

This latter usefulness, if found to be language-universal, may eventually be exploited to the extent that, for any given language, we will be able to generate acceptable narrative paragraphs and discourses which reflect minimal semantic skewing and minimal grammatical complexity so far as the paragraph and discourse structures are concerned. Alternatively, we will be able to generate acceptable paragraphs and discourses which reflect maximum semantic upset and grammatical complexity.

References.

- Beekman, John. 1970. Propositions and their relations within a discourse. Notes on translation. 37.6-23. Mexico: Instituto de Linguistico de Verano.
- Bellert, Irena. 1970. On a condition of the coherence of texts. Semiotica. II.4.335-363.
- Bever, T. G. and D. T. Langendoen. 1971. A dynamic model of the evolution of language. Linguistic inquiry. II.4.433-463.
- Klammer, T. P. 1971. The structure of dialogue paragraphs in written English dramatic and narrative discourse. Unpublished Ph.D. Dissertation. University of Michigan.
- Longacre, Robert E. 1968. Discourse, paragraph, and sentence structure in selected Philippine languages. 2 volumes. Research report written pursuant to Contract No. OE-O-8-062838-

9391 with the U.S. Department of Health, Education and Welfare. Summer Institute of Linguistics Publications in Linguistics and Related Fields, Number 21. Santa Ana, California.

National census, Nepal. 1961. Results (part-2). Kathmandu: Central Bureau of Statistics.

Pelc, Jerzy. 1971. On the concept of narration. *Semiotica*. III.1.1-19

Pike, Kenneth L. 1966. Tagmemic and matrix linguistics applied to selected African languages. Research report written pursuant to Contract No. OE-5-14-065 with the U.S. Department of Health Education and Welfare. Summer Institute of Linguistics Publications in Linguistics and Related Fields, Number 23. Norman, Oklahoma. 1970.

_____ and Kent H. Gordon. 1972. Preliminary technology to show emic relations between certain non-transitivity clause structures in Dhangar (Kudux, Nepal). *International journal of Dravidian linguistics*. I.1.56-79.

_____ and Evelyn G. Pike. Seven replacement substitution exercises for studying the relation between the semantic and the grammatical structures of discourse. To appear in *Linguistics*. A paper presented to the summer meeting of the Linguistic Society of America, at Buffalo, N.Y., July, 1971.

_____ and Burkhard Schoettelndreyer. 1972. Paired-sentence reversals in the discovery of underlying and surface structure sentences in Sherpa discourse. *Indian linguistics*. 35.1.72-83.

Wise, M. R. and H. G. Green. 1971. Compound propositions and surface structure sentences in Palikur (Arawakan). *Lingua*. 26.252-280.

Footnotes.

¹Dhangar is a Dravidian language and a dialect of Kudux (India). It is spoken by about 10,000 persons in the Terai districts of Nepal. See National Census: Results (part-2), Table-8, p. 20 (1961).

This work on Dhangar--and that in the earlier article in the series, "Preliminary Technology to Show Emic Relations between Certain Non-Transitivity Clause Structures in Dhangar (Kudux, Nepal)," Vol. I.1.56-79,

Footnotes. (cont'd)

1972—was done pursuant to an agreement of cooperation between the Summer Institute of Linguistics and Tribhuvan University, and has been carried out under the auspices of the Institute of Nepal Studies of the University. The authors wish to express their gratitude to the Institute of Nepal Studies for their part in making this research possible.

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In general, Gordon has contributed the language data, the specific analysis and conclusions. Pike has provided the theoretical stimulus and working assumptions.

²We numbered the sentences on the basis of our first preceptions of phonological and semantic divisions. Other investigators might have chosen to number the sentences somewhat differently.

³Saukhi Lal Prasad Uraon (author of the text), Banthu Uraon, Ram Prasad Uraon, and Shib Kumar Das Uraon assisted us at various stages of the research in the ways we have indicated. We are grateful for the part they had in making this research in Dhangar-Kudux possible.

⁴Bellert, p. 361.

⁵It may be equally true to say that the further removed we are from the author in time, culture, and world-view, the less likely it is that we will be able to specify, unambiguously, all semantic relations which the author intended.

⁶Many of the spelling conventions adopted for the text are convertible to the underlying phonemic equivalents without special comment. Others are as follows:

ee, etc.	= long vowels
nG	= velar nasal
t	= glottal catch
R, D	= retroflex consonants
:	= consonant gemination
N	= nasalization of preceding vowel

⁷For a more comprehensive discussion of semantic linkage in relation to paragraph structure in Philippine languages see Longacre (1968).

⁸Longacre (1968).

⁹In the development of this matrix diagram we profited from discussions with Dr. Francis Elka, of the Central Institute of Indian

Languages, Mysore, India.

¹⁰Our translation of this passage (10...-13) given above under Section C reflects the ambiguity that in all probability is present also in the original Dhangar text. The translation might lead one to believe that 11-12 recount the reason for Mankhu's leaving school in 9. The author of the text insists, however, that first of all Mankhu left school with the intention of returning (9), then his father, taking advantage of the opportunity, told him to leave school for good (11-12). It was at the father's request, then, that Mankhu finally left school (13).

¹¹The latter half of Sentence 14 appears to do more than recapitulate 9...-13 since it contains information that is not explicitly mentioned in 9...-13. That information is, however, implicit in 9...-13 in that his leaving school was for the very purpose of doing the farm work mentioned explicitly in 14.

¹²For a brief discussion of the relation of grammatical structure to the form in which sentences are understood see Bever and Langendoen (1971). They hold that there is experimental evidence to show that "perceptual strategies are sensitive to the external patterning of major syntactic categories" (p.436) and that "listeners make primary use of an ordered set of perceptual strategies which directly map external strings onto their internal structures" (p. 435). The discussion is restricted to intra-clausal and inter-clausal grammatical relations. It would be interesting and worthwhile to see this discussion extended to include the grammar of narrative discourse.

¹³See Pike and SchoettleIndreyer (1972) for a discussion of primary versus secondary reversal in relation to the analysis of a Sherpa text.