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A Discovery Procedure for Transformational Paradigms

David D. Thomas

The following thoughts are based largely on having followed John Banker's progress in arriving at his Bahnar paradigms, modified by other general considerations. This is just a tentative suggestive outline.

Briefly stated, the general procedure being advocated is the following: 1) Find the clause patterns in text material; 2) using one verb in one contextual situation check it through every possible variation with an informant; 3) follow the same procedure for other verbs, getting maximum paradigms for each; 4) distill out the general paradigmatic patterns. These will be expanded and discussed in more detail below.

The basic premise of transformational paradigms is that there are statable relationships between sentence patterns such that a speaker can with confidence construct new sentences if he knows that other related ones are valid. Transformational paradigms therefore attempt to state the range, variety, and limitations on sets of related patterns, such that any set of major-class words which can fit any member of the paradigm (or certain diagnostic members) can also fit any other member of the paradigm. Thus, if I know that the phrase Mary's having seen the house is meaningful and grammatical (well-formed), I can deduce that Mary saw the house, the house was seen by Mary, Mary would have seen the house, etc., would also be meaningful and grammatical should I have need to use them. This means that, given a clause root and information as to which paradigm it belongs in, I can build on that root any member of the paradigm.

Related sentences are defined as sentences of which the grammaticality of one is predictable from the grammaticality of the other, either unilaterally or bilaterally. This in effect means that related sentences are those which have the same major words, and that they differ only in function words, in word order, or in statable obligatory or optional deletions. (cf. Hiz)

Generalized paradigm formulas can be stated in terms of variables (major word roots), constants (function morphs), word order, and deletions.

In practice it seems to be appearing that the verb is usually the most crucial element in determining the paradigm membership of a clause root. Nouns in general are more flexible and can be used in almost any paradigm, but verbs are frequently confined to just one paradigm. In Bahnar (cf. Banker) it has been found that the class membership of a verb automatically predicts the paradigm membership of any clause root in which that verb appears, though in Mansaka (cf. Thomas) noun classes do seem to have some effect upon the paradigm membership of clause roots.

The discovery procedure outlined below is built on the preceding considerations.

- I. Go through text material to see what clause patterns are found. Identifications of patterns are of course very tentative. Take a separate sheet of paper for each variation in pattern, listing all examples. (Longacre's clause procedures are helpful.) The presence of different function words or of different minor-class morphemes should be considered as indicating a different pattern. It is desirable to have connected text on the same subject so as to get frequent repetition of the same nouns and verbs; or have several different versions of the same story or different texts on the same subject. E.g.:

<u>Subi.</u>	<u>Verb - ed</u>	<u>Object</u>
John	saw	a bear
The bear	made	tracks
Hunters	shot	animals of all kinds
The animal	saw	John

<u>Subject</u>	<u>may</u>	<u>Verb</u>	<u>Object</u>	<u>Location</u>
Animals	may	see	the hunter	in the distance
Hunters	may	shoot	animals	in the forest

The purpose of this step is to get a preliminary identification and listing of the various clause patterns, holding down the vocabulary where possible.

- II. Look at the lists of nouns filling the various slots in the various patterns to see if there are any obvious differences between classes of nouns. If there hasn't been enough recurrence of the same nouns to give a distinct picture of same or different classes, check with an informant whether it is possible to substitute the missing nouns, so as to fill out the resemblances between the classes of slot fillers. Presumably most nouns will be able to fill most noun slots
- III. Pick out a few of the more common verbs and compile a list of the patterns in which they occur. These in effect will be preliminary uncontrolled sample paradigms, whose main function is to suggest to the investigator some of the possible relationships, ranges, and variety that he may expect, and may suggest possible fruitful avenues for investigation. E.g.:

see

The hunter saw the bear.

The bear didn't see the man.

The foot prints were easily seen.

The posse saw the evidence.

run

Bears don't run fast.

John ran a few steps.

The bear ran away.

- IV. Choose a common transitive verb and two nouns which fit well with it as subject and object, and use these as a clause root for detailed experimentation. It is well to choose nouns whose roles as subject and object of the action are not readily reversible, to prevent confusion from role-switching. John saw Bill is said just as readily as Bill saw John, but it would take some detectable mental gymnastics before the house saw John would be accepted as a reasonable variant of John saw the house. Different clause roots would be created if situational roles are not held constant, which would remove the forms from the paradigm under consideration. (cf. Thomas)

Using this clause root, check it with an informant to try to fit it into every pattern that was discovered in step I. List those forms which are found to be grammatical on a piece of paper. (cf. Thomas pp. 1,6, Banker pp. 12ff) Because an informant will frequently say yes to things that really are not acceptable, it would serve as a good cross-check if you can get him to use the desired sentence in a larger context, i.e., ask him to make up a short story of 3 or 4 sentences in which he uses the desired sentence.

After having tried this clause root in every pattern discovered in step I, the investigator may if he wishes try it out experimentally in other patterns which he suspects may exist. But these of course would have to be carefully cross-checked as suggested above.

This procedure should result in a full paradigm of the possible forms on this one clause root.

Make formulas using numbers (Thomas, 1) or abbreviations (Banker, 12ff) for the major words (nouns, verbs, adjectives, etc.) and writing out the minor words in full (prepositions, affixes, particles, etc.). Make a new formula for each variation in minor words or in order.

- V. Holding the verb in the clause root constant, substitute other nouns one by one in the above paradigm, looking to see if any restrictions or other possibilities appear from using other sorts of nouns. Care must continually be exercised against switching situational roles in the middle of a paradigm.
- VI. Up to this point attention has been concentrated on clause structures. Now the phrase structure should be examined to see if clauses or clause derivatives can occur as complex fillers of a phrase slot. These nominalizations should be added to the paradigms, as they are transformations from the same clause root. Any verb root in a noun phrase should be watched as a possible indicator of a nominalized clause. Nominalizations may focus on any major element of a clause root (Banker, 15,24,32), so that there may be several nominalization forms for the same clause root. Deletion, optional or obligatory

of non-focused major elements frequently occurs in nominalizations, and the rules for such should be noted. Sample nominalizations on the clause root Mary-actor saw-action the house-goal: Mary's seeing the house, the seeing of the house, Mary's seeing, the seeing of Mary, Mary's, which Mary saw, who saw the house, etc.

Take the clause root used in step IV and try changing it into the form of each of the nominalizations, embedding these nominalizations in longer sentences. Watch to make sure that the situational roles still remain constant in the nominalized forms.

Then substitute other nouns into the clause root, and run these new roots through the same nominalizations, cross-checking with the informant to make sure that they are still grammatical and meaningful. Frequently context will be necessary if items have been deleted in the nominalizations.

- VII. Follow the same procedure with clause-like forms, infinitive structures, participial structures, etc., which are embedded in the verb phrase. First take the test root through these transformations, then change the root by substituting other nouns. E.g., to see the house, Mary having seen the house, having seen the house, seeing the house, etc.

Then check subordinate clauses on the sentence level, using the patterns found in text. Look to see what differences in structure occur, if any, when the test clause root is recast in the form of the various subordinate clauses (conditional, time, purpose, contrary to fact, etc.). Because Mary saw the house, if Mary had seen the house, when Mary saw the house, etc. Add these to the paradigm.

Then vary the root again as above. But be sure to keep each clause root listed separately, as each one is a new paradigm and they must not be confused. Compare the paradigms on the various clause roots and see how alike or different they are.

- VIII. Now start substituting other verbs in the clause root. Here is where differences from the paradigms found above are most likely to start appearing. It is important to get one paradigm pattern well established, as in the preceding steps, before getting involved in variant patterns.

Start first with substituting other verbs in the same test clause root, as the pattern would be more likely to remain fairly constant with the same type of verbs. (E.g., Mary touched the house) Periodically check through again with different nouns to make sure that the principles found in step VI still hold in these new clause roots. (Mary touched Susie, Mary touched the dog, the tree touched the house)

When a number of verbs have shown the same or very similar patterns of transformation, this can then be taken as showing one fairly solid pattern of clause paradigms. It is then time to start picking other kinds of verbs from the text (went, knew, read, was), checking through to see what new patterns they take, what old patterns they take, and what old patterns they do not take.

Continue to keep the clause roots separate, never switching the situational roles of the major elements nor substituting

- other words for any of the major elements within a paradigm.
- IX. When a large number of paradigms has been collected, start examining them, combining all paradigms which have the same set of formulas. There will probably be several sets which are clearly different; these can be separated as different emic paradigms and given a label or number. There may be one or two forms in them which are similar, but if in general they are different then separate them. It should be noted which forms in the paradigms are unique to one particular paradigm and which forms occur in more than one paradigm. The unique forms are diagnostic for their particular paradigm. There may be cases where the majority of the forms in two paradigms are alike but just a few forms are different or missing. These can sometimes be treated as subtypes of one paradigm (cf. Banker, 17, 19).
- X. Using the results obtained above, go through text material to make sure that all forms in the text have been accounted for. Any new forms encountered should be checked through the paradigms. Also try making up new sentences on the basis of the paradigm rules. If at any time the application of the rules results in an unacceptable sentence, the rules should thereupon be revised or refined to take account of this fact.
- XI. Write up the paradigms, including statements as to what kind of clause roots are most apt to fit which particular paradigms; if the verb is the main factor, give lists of verbs for each paradigm type. State all rules and restrictions and give any other additional pertinent information. Since peripheral elements in a clause can in many languages be added in the same form to any clause type, it may frequently be found useful and more compact to put only nuclear clause elements in the paradigms, and consider the peripheral elements as paradigm multipliers. (Cf. Banker, 36)
- When several function words act alike or are mutually substitutable in the same formula, it is frequently convenient to combine them into one formula, treating them as a single homogeneous class of functors. (E.g., the English modals shall, will, may, etc.)
- The procedures that have been suggested here are based on a complementary use of text material and informant. The informant is necessary to fill out the gaps in paradigms obtained from text and also to ensure that the resultant description is generative, i.e. that it would enable the reader to correctly predict new forms which neither the reader nor the analyst has actually encountered before. The text material is necessary as an initial source for patterns, as a check on the imagination of the informant to ensure normality, and as a final check on the results. Thus both text and informant are essential, and the lack of either one will seriously handicap the final results. With a judicious use of both, the results should be both generative and normal.
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