

EMBEDDING AND COORDINATING TRANSFORMS IN SIANE

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0. INTRODUCTION

Many articles have been written highlighting contrasts in clause types manifested by the form and distribution of verbal elements generally known as "medial vs. final" by students of New Guinea languages. The present paper is an attempt to highlight the underlying similarity of clause structure in Siane,¹ with surface differences caused by differing embedding or coordinating constructions and deletions of identical elements. For this purpose a transformational-generative descriptive model has been chosen.²

Three types of Siane sentences will be considered: 1) simple (single-clause) sentences, 2) sentences with a relative clause embedded in one (or more) of the constituents and 3) sentences consisting of a series of concatenated clauses having a simultaneous or sequential time relationship. One example of each of the first two and two of the third will be treated in detail.

The underlying structure of each example will be given in the form of a branching tree diagram to illustrate the application of the constituent structure rules.³ Rules will then be proposed to transform the underlying trees into their respective surface representations. Motivation for each rule and its proposed ordering will be provided. A full list of the ordered transformational rules herein discussed will be given in section 5.

1. CONSTITUENT STRUCTURE RULES

The following tentative constituent structure rules, a small illustrative portion of the base component of a transformational-generative grammar of Siane, will generate the underlying structures of

the examples used in this paper as well as many other Siane sentences.⁴

S ----> #S# (SQ#S#)ⁿ
 S ----> NP VP M
 VP ----> MV (AUX)
 MV ----> (NP) V
 AUX ----> (NEG) (COMPL) (POT)
 NP ----> (#S#M) N

2. SIMPLE SENTENCE

Example 1 illustrates almost the simplest possible structure of a Siane sentence. The only optional elements chosen are the object NP *lóno work* and the AUX *en potential*. All other nodes are obligatory. The tree analysis of the underlying structure of example 1 is shown in Phrase (P) Marker 1.

Example 1.

Surface structure: *lóno ólunályê He will work.*

Constituent analysis of surface structure:

lóno olú-en-al-e
work hold-will-he-.

Three general transformational rules are necessary to produce the given surface string from the underlying string. First, an obligatory person-number insertion rule (T:PRNUI) inserts a pronominal suffix following the verb and guarantees agreement between the subject and verb of the sentence. Second, an obligatory person-number auxiliary permutation rule (T:PRNUAUXPERM) reverses the order of the two elements, person-number and auxiliary. Third, an optional pronoun deletion rule (T:NPRODEL) deletes the pronominal subject.

T:PRNUI

SD:	<u>X # (S M)</u>	N	Y	V	Z	OBLIG
		[αPR]				====>
		[βNU]				
	1	2	3	4	5	

SC: 1, 2, 3, 4 + PRNU, 5

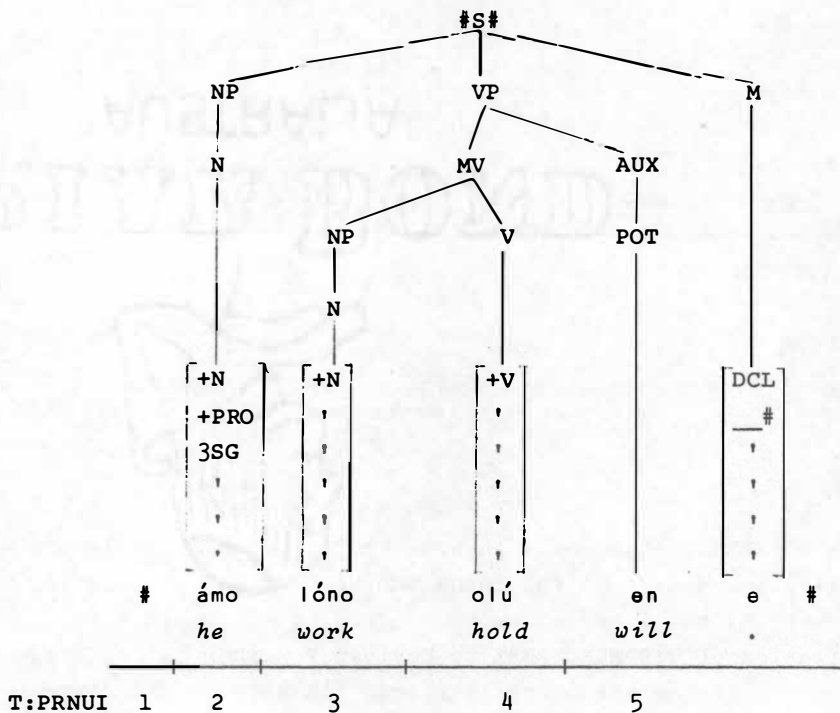
α PR	α PR
β NU	β NU

Cond: 2 and 4 < the same S

T:PRNUI states that for any string, given a sentence (S), the verb which it dominates is marked with the same person-number features as the subject noun which it dominates, and that there is inserted following the verb a person-number element also marked with the same person-number features. The choice of this obligatory element from the lexicon is predictable once marked with appropriate person-number features and contextual features; this is not true of the subject noun. Since the occurrence of the person-number element is obligatory in the surface structure, T:PRNUI is obligatory.

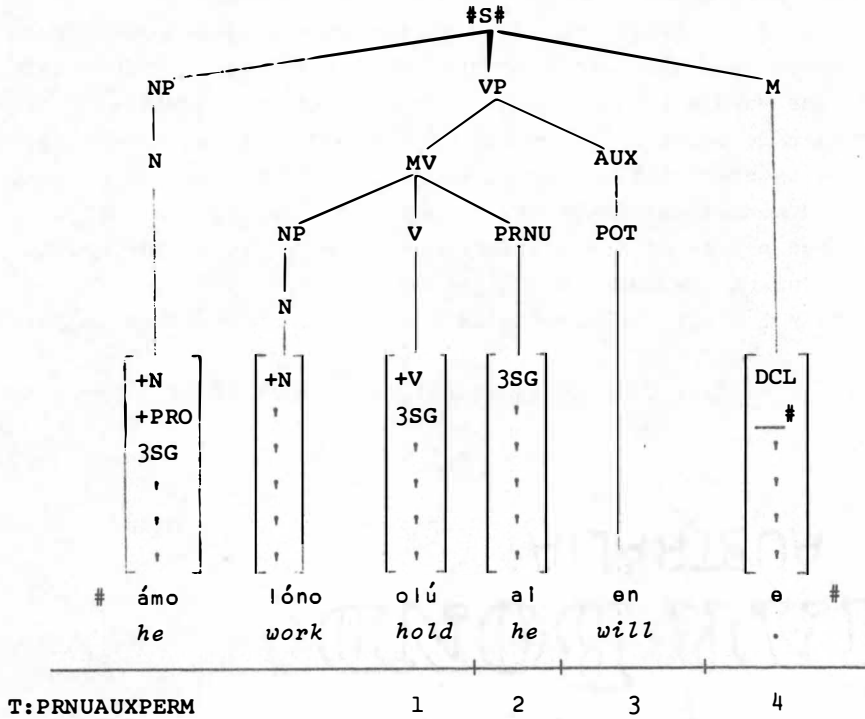
P Marker 1 meets the structural description of T:PRNUI as marked.

P Marker 1: Tree diagram of underlying structure of example 1.



Application of T:PRNUI to P Marker 1 produces the derived tree shown in P Marker 1a, which in turn meets the structural description of T:PRNUAUXPERM as marked.

Derived P Marker 1a. (Derived from P Marker 1 by application of T:PRNUI)



T:PRNUAUXPERM

SD: X V PRNU AUX Y OBLIG
 1 2 3 4 =====>

SC: 1, ∅, 3+2, 4

T:PRNUAUXPERM obligatorily inserts the person-number element after the auxiliary and erases it following the verb, thereby permuting the person-number and auxiliary elements.

Application of T:PRNUAUXPERM to Derived P Marker 1a results, after the application of the phonological rules,⁵ in a fully grammatical Siane sentence, shown in Derived P Marker 1b. To derive example 1, a further optional transformation applies, T:PRODEL:

Example 2.

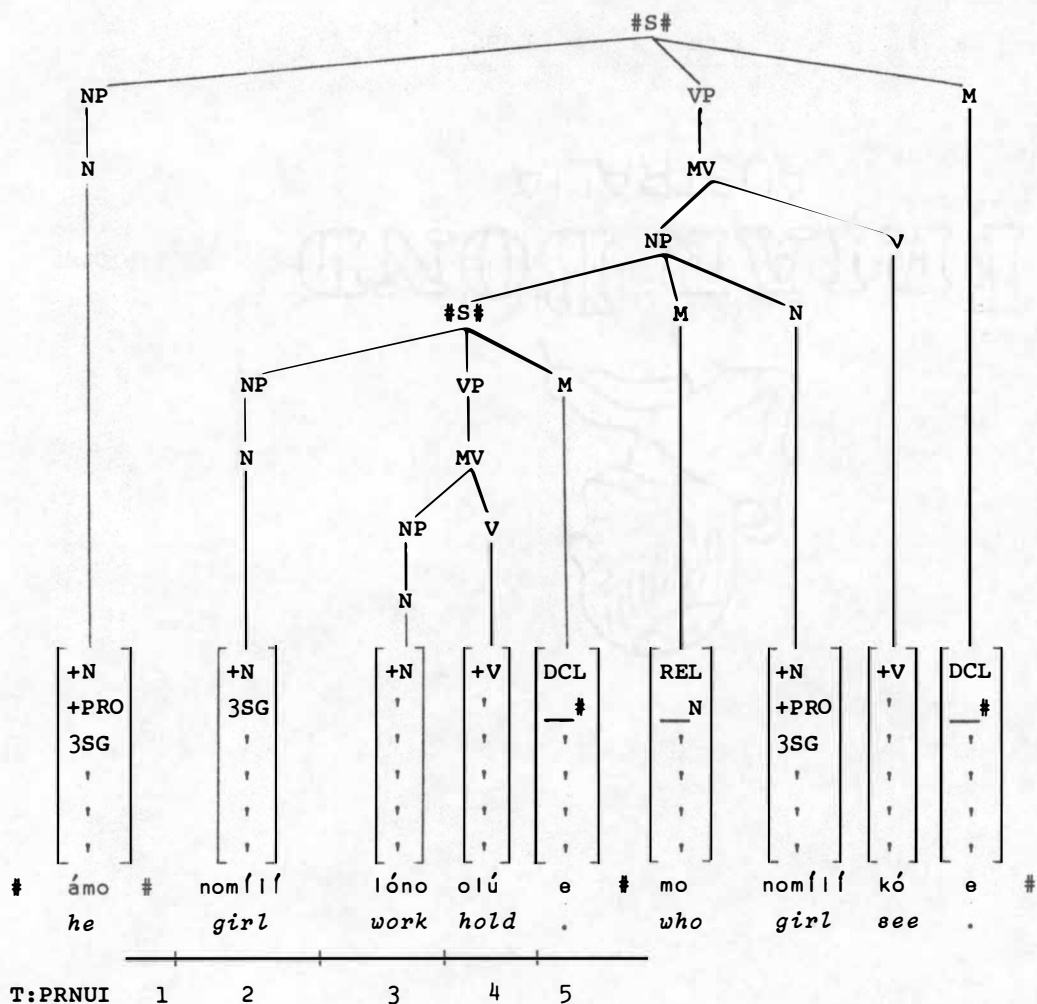
Surface structure:

lóno olámí nomlíl káíye *He sees the girl who works.*

Constituent analysis of surface structure:

lóno olú-al -mo nomlíl kó-al-e
work hold-she-who girl see-he-.

P Marker 2. Tree diagram of underlying structure of example 2.



P Marker 2 meets the structural description for application of T:PRNUI to the embedded sentence on the first cycle as marked, and the result is shown in Derived P Marker 2a.

In addition to those discussed in section 2, two further transformational rules are necessary in the case of embedded relative clauses.

T:NIDDEL obligatorily deletes the subject noun of an embedded sentence if and only if it is identical with the noun of the NP in which it is embedded.

T:NIDDEL

SD: X # N Y # M N Z OBLIG
 =====>

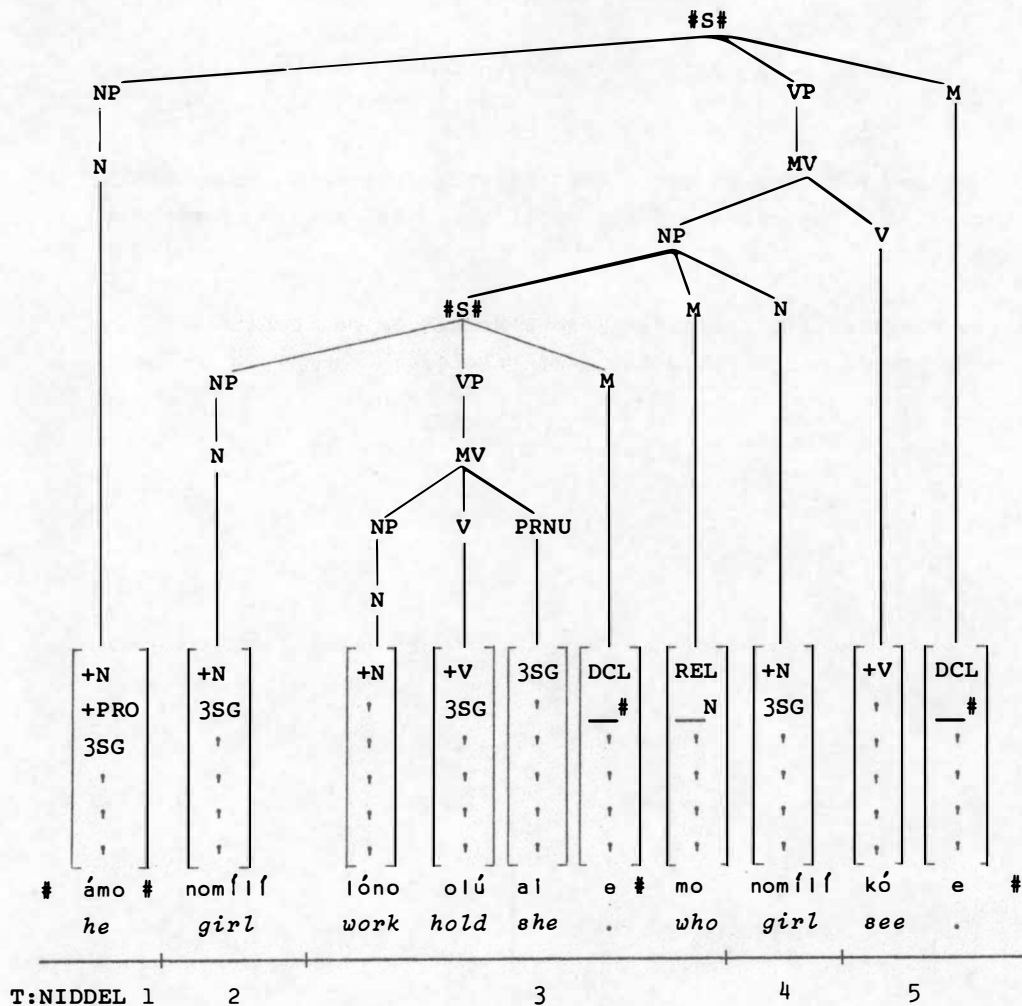
1 2 3 4 5

SC: 1, ∅, 3, 4, 5

Cond: 2=4

Derived P Marker 2a meets the structural description of T:NIDDEL as marked, and the result of its application is shown in Derived P Marker 2b.

Derived P Marker 2a. (Derived from P Marker 2 by application of
T:PRNUI, first cycle)



The following obligatory rule then replaces the modal of the embedded sentence with the relative suffix and erases the boundary symbols of the embedded sentences, as the final rule of the transformational cycle. None of the other transformational rules are applicable to the particular embedded sentence of this example, as their structural descriptions are not met.

T:MREPL

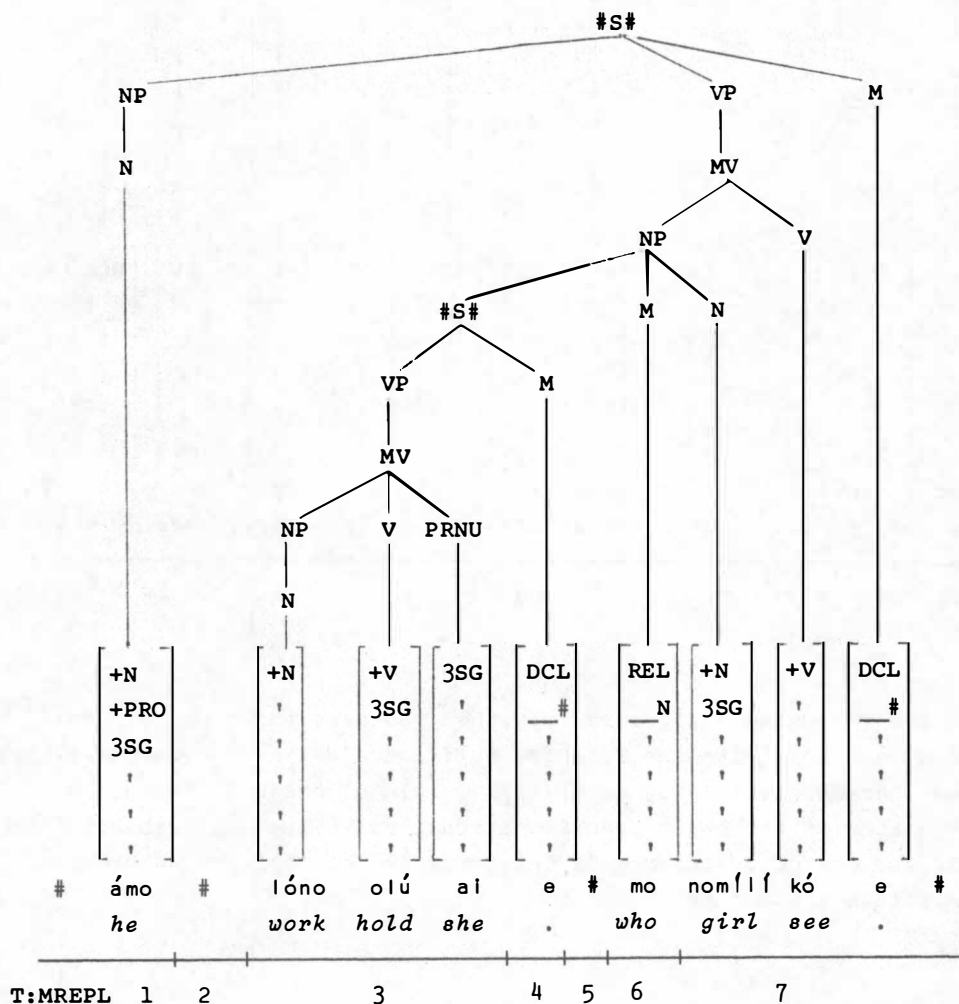
SD: X # Y M # M N Z OBLIG
 1 2 3 4 5 6 7 ----->

SC: 1, ∅, 3, 6, ∅, ∅, 7

Cond: 4 > DCL

Derived P Marker 2b meets the structural description of T:MREPL as marked, and the result of its application is shown in Derived P Marker 2c.

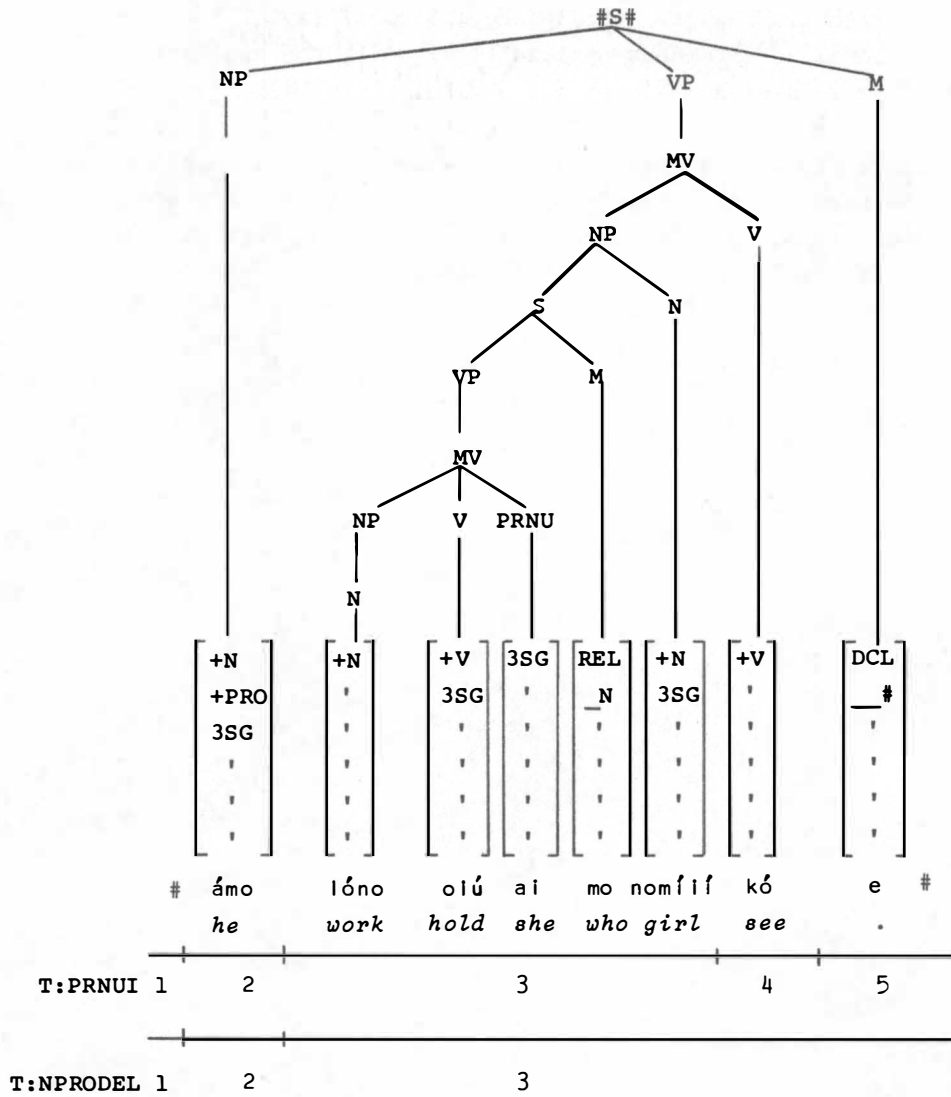
Derived P Marker 2b. (Derived from P Marker 2a by application of T:NIDDEL, first cycle)



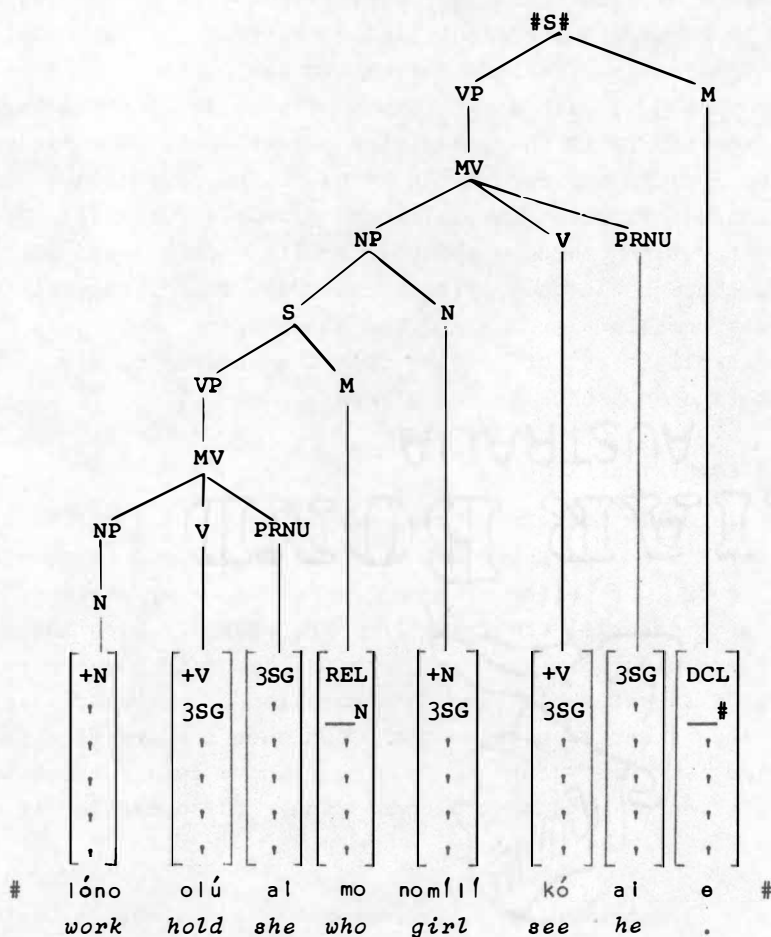
The application of T:PRNUI to the matrix sentence after the completion of the first cycle results, after the application of the phonological rules, in a fully grammatical Siane sentence. The resulting string does not fit the structural description of any of the other transformational rules except optional T:NPRODEL, the application of which results in a paraphrase of the string.

Derived P Marker 2c meets the structural description of both T:PRNUI and T:NPRODEL as marked, and the result of their application, shown in Derived P Marker 2d, is the tree analysis of the surface structure of example 2. The application of the phonological rules would then result in the surface string as given.

Derived P Marker 2c. (Derived from P Marker 2b by application of T:MREPL, first cycle)



Derived P Marker 2d: Tree diagram of surface structure of example 2.
 (Derived from P Marker 2c by application of
 T:PRNUI and T:NPRODEL, second cycle)



T:PRNUAUXPERM, T:NIDDEL and T:NPRODEL are independent of each other as to ordering; however, each must be ordered following T:PRNUI and preceding T:MREPL. The necessity for ordering T:PRNUAUXPERM and T:NPRODEL following T:PRNUI has been dealt with in section 2. T:NIDDEL must follow T:PRNUI for reasons similar to those given for T:NPRODEL: if T:NIDDEL preceded T:PRNUI, it would be impossible to specify the person-number features for V and PRNU in exactly those embedded sentences in which the subject noun, identical to the noun of the NP in which it is embedded, had been deleted. T:MREPL is the final rule of the transformational cycle, since its application results not only

in the replacement of the final M of an embedded sentence with the relative M morpheme, but also deletes the sentence boundary symbols, completing the cycle on that level of embedding. It therefore must be ordered following all other transformational rules of the cycle.

T:MREPL is of particular significance in regard to the consideration of the "medial vs. final" dichotomy in New Guinea languages. First, the provision of such a rule makes it possible for the base component to specify fully the underlying constituents of embedded relative sentences, in particular the "final form" of embedded sentences which underlie the "medial form" output structures. Second, the relationship of an embedded sentence to its matrix sentence is clearly shown through the underlying structure. Third, together with the other transformational rules and the phonological rules, it provides a concise and explicit way of getting from the underlying structures to the output (spoken) sentences of Siane.

4. CONCATENATED SENTENCES

The statistically most frequently occurring "medial form" verbal constituents of Siane utterances are what may be called -to constructions, which occur in a series of concatenated verbs or clauses in simultaneous or sequential time relationship, each of which includes an indication as to whether the next verb or clause in the series has the same or a different subject.⁶ Consideration of the underlying structure of such a series reveals that each such construction is a fully specified sentence occurring in a coordinate construction, with obligatory deletion of redundant elements under the operation of concatenation.

4.1. Example 3 illustrates one such coordinate construction having the same subject throughout the concatenated string.

Example 3.

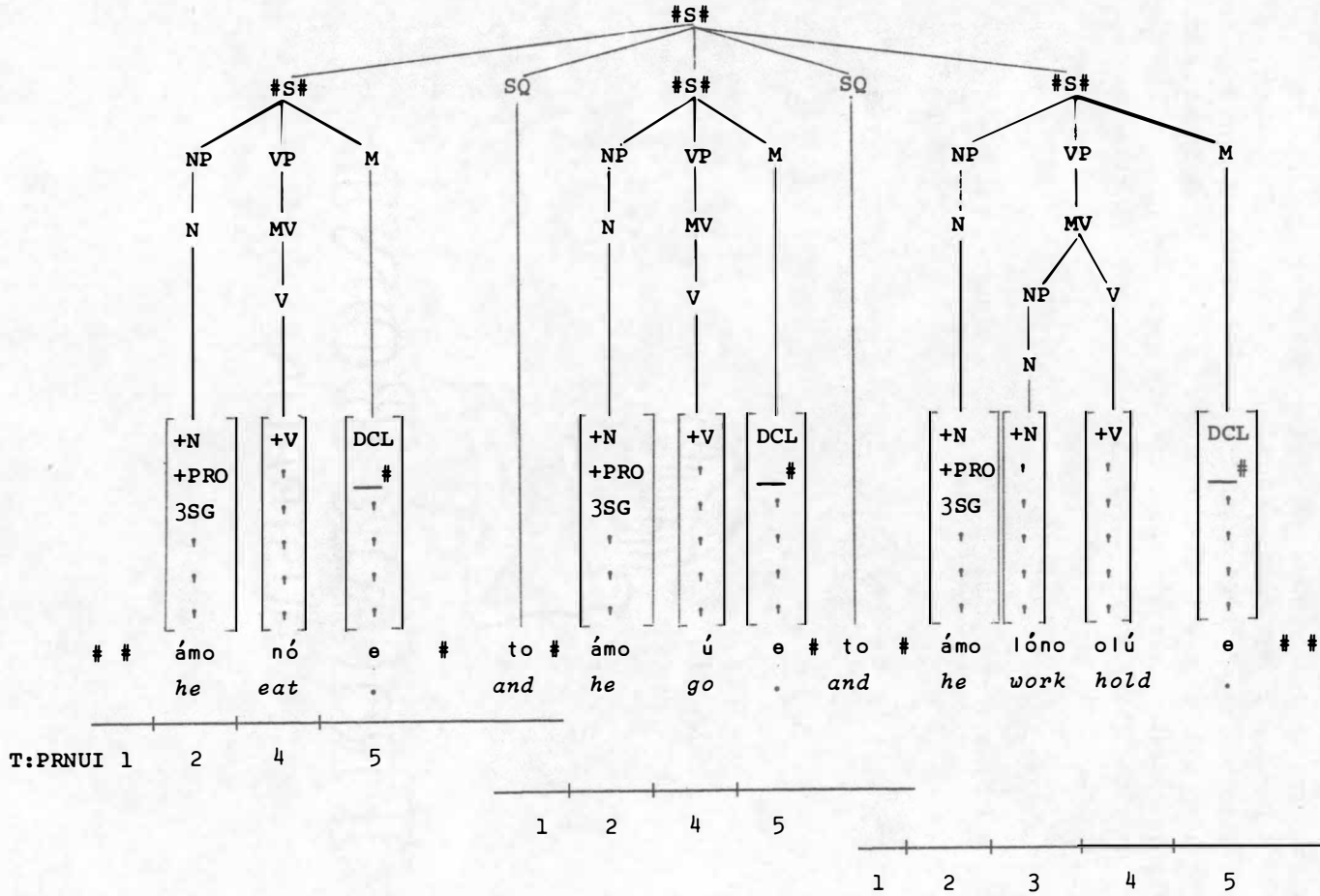
Surface structure:

nóto úto lóno ólalyê *He ate, and went and worked.*

Constituent analysis of surface structure.

nó-to ú-to lóno olú-al-e
eat-and go-and work hold-he-.

P Marker 3: Tree diagram of underlying structure of example 3.



P Marker 3 meets the structural description for application of T:PRNUI to each of its concatenated sentences as marked, and the result of its application is shown in Derived P Marker 3a.⁸

A further transformational rule is needed to account for the obligatory deletion in Siane of the subject NP in all but the first sentences and the person-number element and AUX in VP in all but the last sentences of exactly those concatenated strings in which the subject, auxiliary and modal are identical in consecutive sentences of the string.

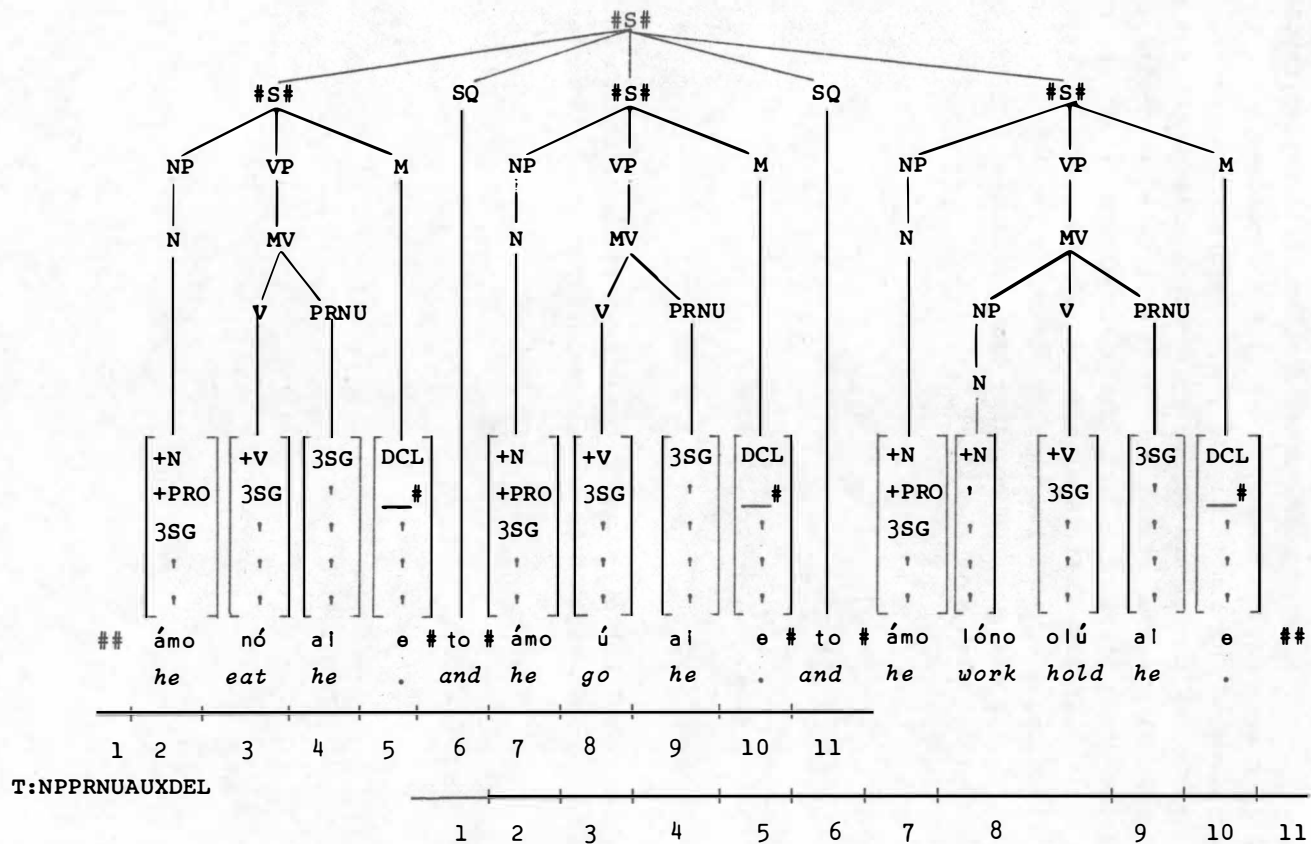
T:NPPRNUAUXDEL

SD: W # NP X V PRNU (AUX) M # SQ # NP Y V PRNU (AUX) M # Z OBLIG
 1 2 3 4 5 6 7 8 9 10 11 =====>

SC: 1, 2, 3, \emptyset , 5, 6, \emptyset , 8, 9, 10, 11

Cond: 2=7, 4=9, 5=10, 3 and 8 \neq SQ

Derived P Marker 3a. (Derived from P Marker 3 by application of T:PRNUI to each of its constituent sentences)



Derived P Marker 3a meets the structural description for the application of T:NPPRNAUXDEL to each pair of consecutive coordinate sentences as marked, and the result is shown in the Derived P Marker 3b.

Derived P Marker 3b is marked for application of T:NPRODEL to the first sentence of the string. None of the sentences meets the structural description of any other rule of the transformational cycle. The application of or failure to apply T:NPRODEL does not affect the grammaticality of the string. It is here applied to derive the specific sentence given in example 3, of which the string resulting from non-application of T:NPRODEL is a paraphrase.

Finally, a conjunction rule, T:SQREPL is needed to replace M with SQ and delete the sentence boundary symbols between any two coordinate sentences in which M is identical for both.

T:SQREPL

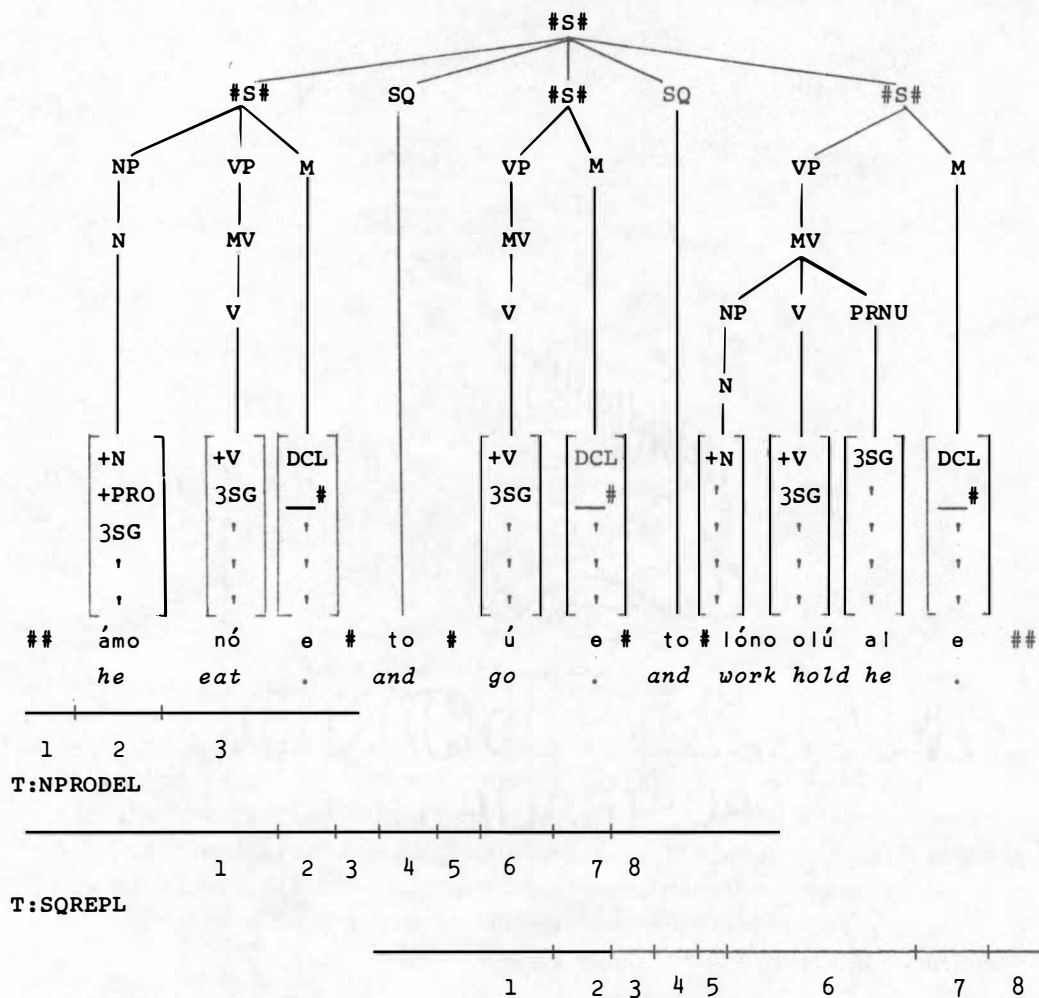
SD:	X	M	#	SQ	#	Y	M	Z	OBLIG
	1	2	3	4	5	6	7	8	=====>

SC: 1, 4, \emptyset , \emptyset , \emptyset , 6, 7, 8

Cond: 7=2, 6 \neq SQ

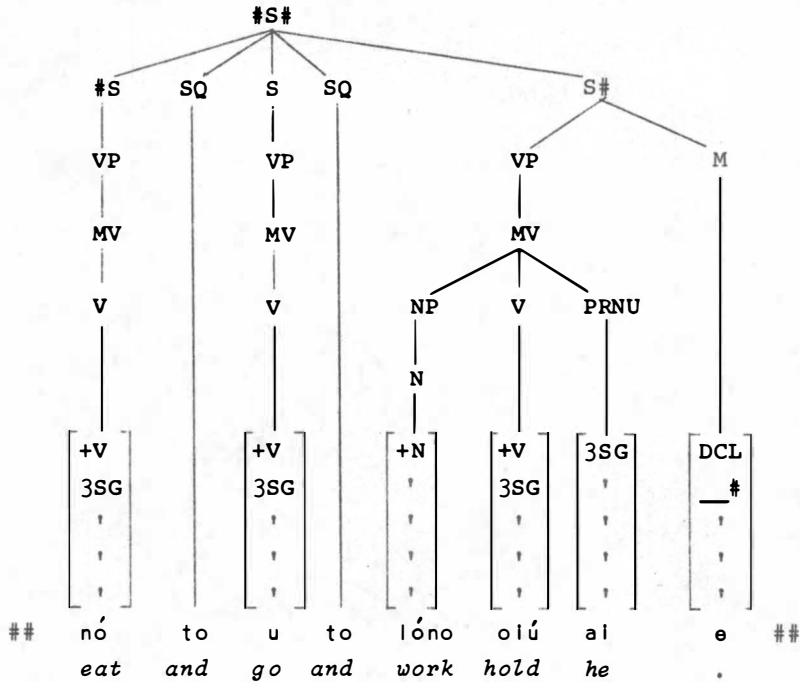
Derived P Marker 3b meets the structural description for the application of T:SQREPL to each consecutive pair of sentences as marked.

Derived P Marker 3b. (Derived from P Marker 3a by application of T:NPPRNAUXDEL to each pair of coordinate sentences)



The application of T:NPRODEL and T:SQREPL to the sentences of Derived P Marker 3b which meet their respective structural descriptions results, after the application of the phonological rules, in the surface structure of example 3, the tree analysis of which is shown in Derived P Marker 3c.

Derived P Marker 3c. Tree diagram of surface structure of example 3.
(Derived from P Marker 3b by application of
T:NPRODEL and T:SQREPL)



4.2. Example 4 illustrates a coordinate construction similar to example 3, but one in which the subject changes between the first and second sentences of the string. The same transformational rules apply to example 4 as to example 3, but the application of T:NPPRNUAUXDEL is blocked between the first and second sentences of the string in example 4, thus correctly deriving the surface structure. The underlying structure of example 4 is shown in P Marker 4.

Example 4.

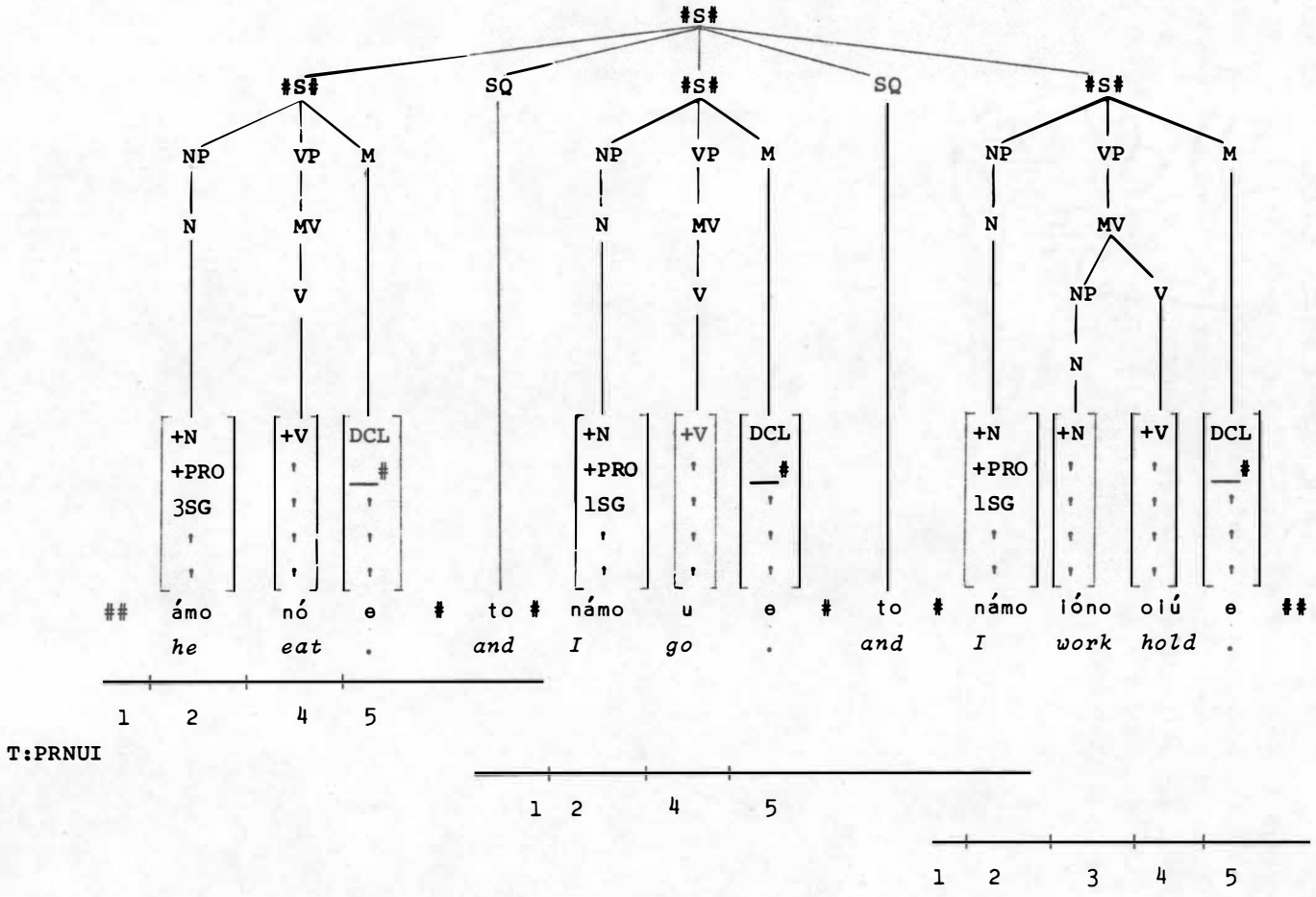
Surface structure:

náito útó l'no ólowâ He ate and I went and worked.

Constituent analysis of surface structure:

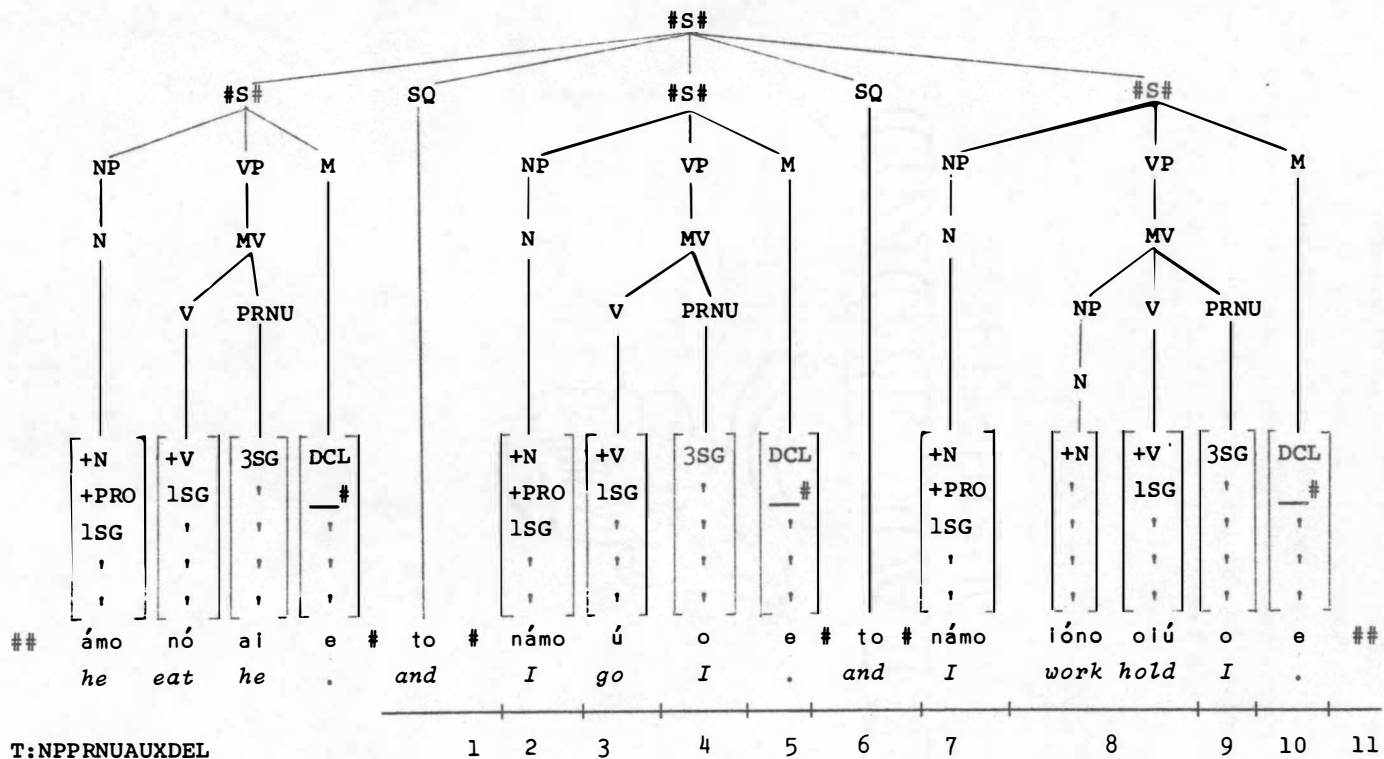
nó-ai-to ú-to l'no olú-o-e
eat-he-and go-and work hold-I-.

P Marker 4: Tree diagram of underlying structure of example 4



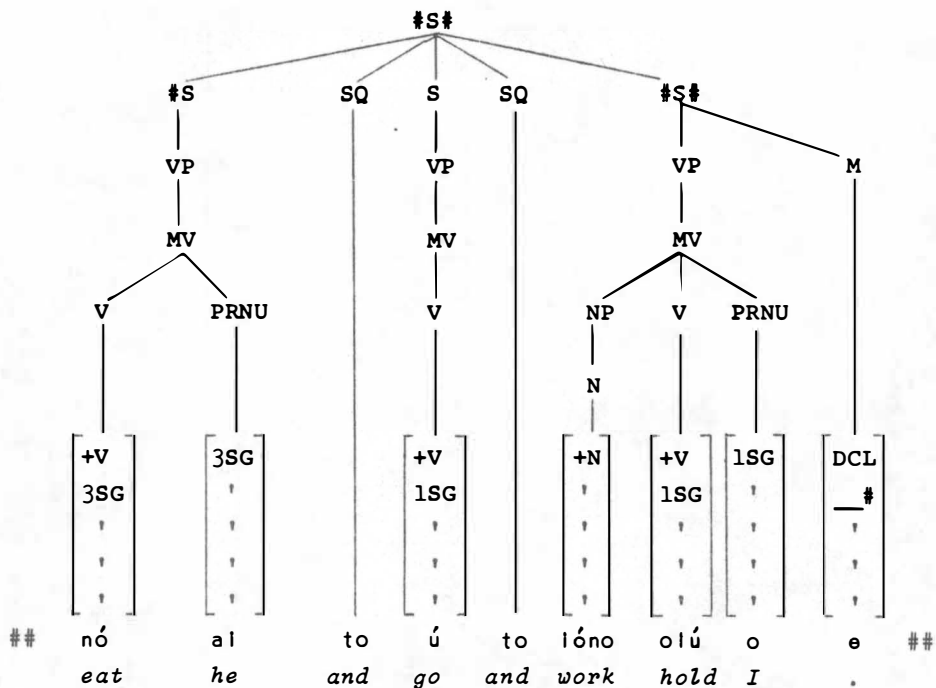
P Marker 4 meets the structural description for the application of T:PRNUI to each of its constituent sentences as marked, and the result is shown in Derived P Marker 4a. This in turn is marked for application of T:NPPRNUAUXDEL to the second pair of coordinate sentences only, as the first pair does not meet the conditions of the rule. Specifically, if the first pair of coordinate sentences of Derived P Marker 4a were to be marked for application of T:NPPRNUAUXDEL, while the conditions 5=10 and 3 and 8 \neq SQ would be met, the first two conditions on the rule, namely that 2=7 and 4=9, would not.

Derived P Marker 4a. (Derived from P Marker 4 by application of T:PRNUI to each of its constituent sentences)



The result of the application of T:NPPRNAUXDEL to P Marker 4a is shown in Derived P Marker 4b, which in turn meets the structural description for application of T:NPRODEL and T:SQREPL as marked. None of the other rules of the transformational component apply. The result, after the application of the phonological rules, is the surface structure of example 4, the tree analysis of which is shown in Derived P Marker 4c.

Derived P Marker 4c. Tree diagram of surface structure of example 4.
(Derived from P Marker 4b by application of
T:NPRODEL and T:SQREPL)



T:NPPRNAUXDEL is independent of T:NIDDEL as to ordering, but must be ordered following T:PRNUI and preceding T:PRNUAUXPERM and T:NPRODEL. If T:NPPRNAUXDEL preceded T:PRNUI, it would be vacuous at that point in the grammar and would need to be repeated following T:PRNUI. If T:PRNUAUXPERM preceded T:NPPRNAUXDEL it would apply redundantly to those concatenated sentences to which T:NPPRNAUXDEL would later apply. If T:NPPRNAUXDEL followed T:NPRODEL, its application would be blocked in exactly those strings of concatenated sentences with identical subject pronouns where one or more of the subject pronouns had been deleted by T:NPRODEL.

T:SQREPL and T:MREPL are mutually exclusive in their application and therefore independent of each other as to ordering, but both must be ordered following all other rules of the transformational cycle, since part of the result of their application is the deletion of sentence boundary symbols on that level of embedding.

5. SUMMARY OF TRANSFORMATIONAL RULES

The transformational rules specified in this paper must be at least partially ordered and most of them obligatorily applied.

1.	T:PRNUI	obligatory
2.	T:NIDDEL	obligatory
3.	T:NPPRNAUXDEL	obligatory
4.	T:PRNUAUXPERM	obligatory
5.	T:NPRODEL	optional
6.	T:SQREPL	obligatory
7.	T:MREPL	obligatory

The specific rules needed for embedding (rules 2 and 7) and for concatenation (rules 3 and 6) are respectively very similar both in their mapping and in the fact that they do essentially the same work for different types of structures. It would seem to capture a generality if rules 2 and 3 and rules 6 and 7 could be collapsed, but the differences in their mapping as well as the differing constraints on their respective applications make it more economical to separate them.

6. CONCLUSION

The similarity of sentence structure underlying quite different "sentence medial" as well as "sentence final" clause forms in the surface structure of Siane is highlighted by the fact that a single very general set of constituent structure rules will generate the underlying structures of widely differing types of surface constructions, as illustrated in sections 1-4 of this paper. The transformational rules further highlight this similarity in that they allow the explicit relationships of each of the elements in the output structures to their underlying structures to be seen through their various operations.

N O T E S

1. The Siane language belongs to the Gende-Siane-Gahuku-Kamano-Fore Family of the East New Guinea Highlands Stock according to Wurm and Laycock, 1961. Five major dialects of Siane (Komongu, Lambau, Ono, Kolepa and Yafiyufa) are mentioned by Salisbury, 1956. Wurm and Laycock include the Yafiyufa dialect (with 4,464 speakers) in the Siane Sub-Family but give it a major separation from the other dialects of Siane (with a total of 15,336 speakers). The examples used in this paper are representative of the Komongu dialect as spoken in Nonambalo, a village near the government patrol post of Watabung in the Eastern Highlands District of the Territory of New Guinea.

2. The writer wishes to express sincere appreciation to members of the faculty of the University of Illinois for introducing her to the values of transformational grammar, and particularly to Professor A.M. Zwicky for consultation and criticism on an early draft of this paper, and to colleagues in the New Guinea Branch of the Summer Institute of Linguistics for criticism and suggestions for making the paper more readable to linguists who have had little or no background in the theory of transformational linguistics. Full responsibility for error or deviation rests with the writer.

3. Constituent structure rules have been called phrase structure rules in some publications.

4. Symbols and abbreviations used in the paper:

AUX	auxiliary	#	sentence boundary
COMPL	completive	--->	is rewritten as
DCL	declarative	===>	is rewritten as
M	modal	()	optional
MV	main verb	() ⁿ	optionally repeated an
N	nominal		indefinite number of times

NEG	negative	'	high tone
NP	noun phrase	^	falling tone
NU	number	W,X,Y,Z	anything or nothing may occur where these symbols appear
OBLIG	obligatory		
OPT	optional	α, β	must be marked the same at every occurrence of these symbols within a given application of the rule
P	phrase		
POT	potential		
PR	person		
REL	relative	<	is dominated by
S	sentence	>	dominates
SC	structural change	∕	does not dominate
SD	structural description	∅	delete
SQ	sequential	<u> </u> #	occurs preceding #
V	verb	1SG	first person singular
VP	verb phrase	3SG	third person singular

5. James, Dorothy J., *A Phonological Cycle in Siane*, 1966, unpublished University of Illinois Master's Essay. Specifically, in example 1, the phonological rules delete the vowel of *en*, insert *y* between *a* and *e*, and respecify the tone to correspond to the surface structure as given.

6. Anticipatory subject markers, which occur in many Highlands languages including several quite closely related to Siane, do not occur in Siane.

Concatenated sentences having other types of relationships are not being ignored by the author, but are beyond the scope of the present paper.

7. Example 3 could also be translated, *He eats, and goes and works*. The absence of any aspect markers in a string indicates rather a lack of than a specification of any particular time or aspect, and hence could have a range of English translations depending on the context.

8. All of the sentences of any concatenated string generated by a coordinating rule such as the first rule listed in section one are operated on simultaneously by the transformational component.

9. The valuable insights on the nature of conjunction contained in Mr. Schane's paper, which could have particular application to sections one and four of the present paper, have not been incorporated herein beyond a few very minor revisions.

BIBLIOGRAPHY

BEE, DARLENE

1965 *Usarufa: A Descriptive Grammar*. University of Indiana
Dissertation.

CAPELL, A.

1948 'Distribution of Languages in the Central Highlands of
New Guinea', *Oceania* 19:104-29, 234-53.

CHOMSKY, NOAM

1965 *Aspects of the Theory of Syntax*. Cambridge, The M.I.T.
Press.

DEIBLER, ELLIS

1963 'The Grammar and Syntax of Gahuku Verbs', ms.

ELSON, BENJAMIN F., ed.

1964 *Verb Studies in Five New Guinea Languages*. Norman,
Summer Institute of Linguistics, University of Oklahoma.

FODOR, J.A. AND KATZ, J.J.

1964 *The Structure of Language*. Englewood Cliffs, Prentice-
Hall, Inc.

KATZ, J.J. AND POSTAL, PAUL

1964 *An Integrated Theory of Linguistic Descriptions*. Cambridge,
The M.I.T. Press.

LEES, R.B.

1960 'The Grammar of English Nominalizations', *IJAL* Vol.26,
No.3, pp.vii-205.

McKAUGHAN, HOWARD

- 1964 'A Study of Divergence in Four New Guinea Languages',
American Anthropologist 66:98-120.

SALISBURY, R.F.

- 1956 'The Siane Language of the Eastern Highlands of New
Guinea', *Anthropos* 51:447-80.

SCHANE, SANFORD A.

- 1965 Unpublished paper on conjunction and coordination,⁹
M.I.T.

WURM, S.A.

- 1964 'Australian and New Guinea Highlands Languages and the
Distribution of their Typological Features', *American
Anthropologist*, Special Publication Vol.66, No.4,
pp.77-97.

WURM, S.A. AND LAYCOCK, D.C.

- 1961 'The Question of Language and Dialect in New Guinea',
Oceania 32:128-43.

