The verbal system in Godié: A daughter dependency approach

Lynell Marchese
SIL-UND

THE VERBAL SYSTEM IN GODIÉ:

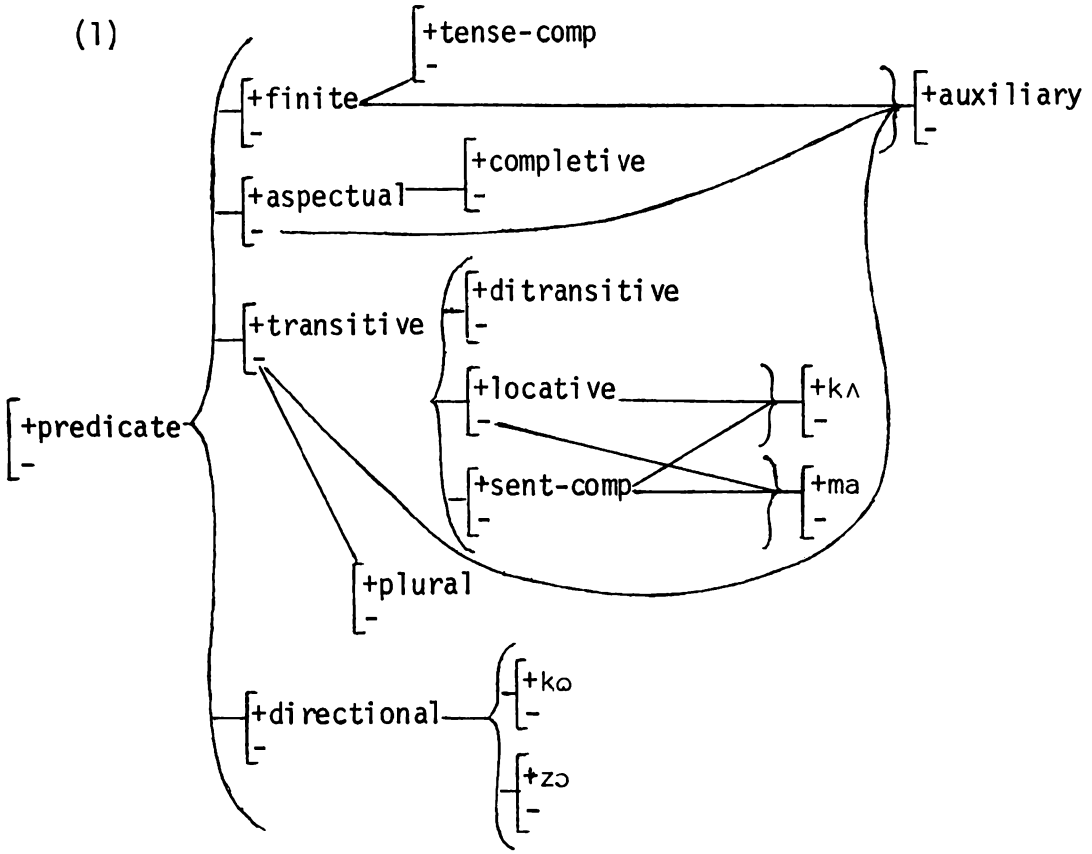
A DAUGHTER DEPENDENCY APPROACH

Lynell Marchese

0. The goal of this paper is to describe the verbal system of Godié,[1] a Kru language spoken in southwest Ivory Coast, within the framework of daughter dependency grammar.[2] This model has been recently developed by the British linguist, R. A. Hudson. The model could be called "generative" since structures are built up through the application of various sets of rules. This type of grammar varies considerably, however, from other generative grammars in that it generates only one structure for each construction (rather than the traditional deep and surface structures, with several intermediate structures in between). Rather than concerning itself with sentence relatedness, DDG concentrates on showing dependencies within a single construction. An important innovation in Hudson's model is the use of features on higher nodes. The paper contains three sections besides the introduction and conclusion. In the first section, there will be a justification of the features used to describe Godié verbs. In section two, rules needed to generate basic and more complex structures will be discussed. Finally, section three contains a discussion of how certain generalizations can be captured by redundancy rules in the lexicon.

1. A basic part of a daughter dependency grammar is classification of all items by features. Binary features are assigned by a set of classification rules. These rules can be diagrammed in a network, resembling system networks developed by Halliday. Below is a diagram of features needed to describe the syntactic behavior of verbs in Godié:

(1)



In the chart above, all items are classified as either + or - predicate. This feature is needed to distinguish predicates from non-predicates such as noun, adverbs, conjunctions, and other non-verbal particles. In this analysis [+ predicate] refers not only to verbs, but also to copulas, auxiliaries and adjectival verbs such as "be big", "be many", etc. The justification for grouping all these into one class is the fact that they all can optionally take tense markers (either the recent particle a or the remote particle wʌ) and they can all function as the main verb of the sentence. This analysis depends, of course, on the interpretation of auxiliaries as main verbs, but this seems to be justified by the fact that they not only take tense markers, but also serve as the host of object clitics, like any main verb. Below are examples of verbal categories which can be grouped together under the feature [+predicate]:

(2) verb mʉ *go*

ɔ -mʉ a sukuˈ3
he go-completive recent school

He went to school.

(3) copula -gʉlʉ- *be*

ɔ -gʉlʉ- a dɔtʌˈ
he is recent doctor

He was a doctor.

(4) adjectival verb 'gɨlɨ' *big*

ɩ 'gɨlɨ' a
they big recent

They were big.

(5) auxiliary yi *potential*

ɔ yio a ɓɔtɔ-
he potential-him recent hit

He was going to hit him.

One of the further subdivisions of the class [+predicate] is made by the entry ± finite. [+finite] refers specifically to those verbs functioning as the main verb in a declarative or interrogative sentence. (Declarative and interrogative sentences, whether negative or positive, will be designated as [+declarative] as opposed to imperatives which are [-declarative]). When any item is both [+predicate] and [+finite], it can be optionally marked as [+tense-comp]. [-tense-comp] will designate a present tense verb, which has no overt marking. [+tense-comp] means a verb is followed by a recent or remote tense marker.[4] Verbs which are [+finite] and which are also specified as [-transitive] and [-aspectual] are classified as [±auxiliary]. These features are needed to distinguish auxiliaries which are obligatorily followed by a verb complement (explained in the sister dependency section) from all other verbs which can never be followed by such a complement. [-finite] will refer to those predicates which are not the main verb in a sentence (and thus cannot be specified for tense). These include any verb co-occuring with an auxiliary, such as ɓɔtɔ *hit* in (5) above, or any verb occurring in compounds or complex verbal complements. [-finite] will also refer to imperatives since they too do not take tense.[5] More importantly, imperatives and other non-finite verbs all carry the same base tone, as shown below.

(6) mʉ *Go!*

ɔ yi mʉ (he AUX go) *he will go* -finite

ɔ -mʉ (he go-completive) *he went* +finite

Independent of the features ± finite, items that are [+predicate] are also classified as [±aspectual]. [+aspectual] indicates those verbs which show a completive-incompletive distinction on the verb stem. [+completive] is marked by low tone on the last syllable of the verb stem. [-completive] is marked by mid tone and a slightly lengthened vowel.

(7) ɔ mʉ (he go-incompletive) *he's going*

ɔ -mʉ (he go-completive) *he went*

he great majority of verbs do have the completive-incompletive **distinc**·ion. Those that don't (-aspectual) include auxiliaries, adjectival erbs, the copula -gʉlʉ-, and the verbs -kʌ *have* and -kɷ *to be at* . hese are outlined in chart (8) below:

(8)

-aspectual	+auxiliary	(-transitive)	yi	*potential*	
			'kʌ	*volitive*	ɔ yi mʉ
			yʌ	*perfective*	*he will go*
	-auxiliary	-transitive	'gɨlɨ'	*big*	
			zu	*many*	
			6ɛ	*too much*	ɩ 'gɨlɨ'
			gi	*a lot*	*they are big*
			'yɔɔ-	*supple*	
			tɛ	*hard*	
			su	*hot*	
			wɔtɔ	*cold*	
			yʌ	*to be in good health*	
			trɷ	*far, long*	
			'flə-	*intelligent*	
			-zʌ	*red*	
			kpɩ	*black*	
			'nʌʌ	*good*	
			-ñu	*bad, ugly*	
		+transitive	-gʉlʉ-	*to be*	ɔ -gʉlʉ- ñʉkpɔ
			-kʌ	*to have*	*he is a-man*
			-kɷ	*to be at*	ɔ -kɷ suku'
					he is-at school

[+predicate] items are also independently specified as ± transitive. [+transitive] refers to those verbs which take at least two arguments. This includes copulas which link two NPs, motion verbs which take subject and locative NPs, and other verbs which are normally classified as [+transitive] (hit, kill, greet, etc.):

(9) ɔmɔ' pʉlʉ 'papo
she is Papo — *She's Papo.*

ɔ -6a suku'
he left school — *He left school.*

ɔ bʌ nɔ
he greets him — *He's greeting him.*

Transitive verbs are further specified as [±ditransitive]. [+ditransitive] verbs like ñɛ *give* and fʌ *send* allow the presence of a third argument while [-ditransitive] may only have one argument following the verb:

(10) ɔ -fʌ kifi pʉtʉ [+ditransitive]
he send-completive chief package

Transitive verbs are also independently specified for the feature ± locative. The set of verbs that are [+locative] take regular full noun phrases as any transitive verb. However, when the object of locative verbs are pronominalized, they take special locative pronouns, rather than the normal set of object pronouns.[6] Compare:

(11) ɔ mʉ suku' — ɔ mʉ 'mɔ
he goes school — he goes there

(12) ɔ 6ɔtɔ 'yɪɔ — ɔ 6ɔtɔ ɔ
he hit child-the — he hit him

All other verbs are specified as [-locative].

Some transitive verbs allow complex nominalized complements. Therefore transitive verbs are also classified as ± sentence-comp. [-sent-comp] verbs allow no complex complement, while [+sent-comp] verbs do. Since the complements are of several types, they are subclassified. Two types of complementizers (or nominalizers) occur with only locative verbs. Therefore verbs which are [+sent-comp] and [+locative] are further specified as [±kʌ]. [+kʌ]refers to those verbs which take kʌ complements. This class is quite small and includes, as far as I know, only three members: yi *come*, mʉ *go*, and 6a *come back from*. [-kʌ] refers to those verbs which are locative, but take a dʌ complement. These include -kɷ *to be at* and gwʉlɛ *to stay at*:

(13) ɔ mʉ bi -kʌ
he go walk kʌ — *He goes walking.* / *He's going for a walk.*

$$\begin{bmatrix} +\text{sent-comp} \\ +\text{locative} \\ +\text{kʌ} \end{bmatrix}$$

(14) ɔ -kɷ slɨ dʌ
he is clear dʌ — *He is clearing.*[7]

$$\begin{bmatrix} +\text{locative} \\ +\text{sent-comp} \\ -\text{kʌ} \end{bmatrix}$$

Verbs which are [+sent-comp] but [-locative] are also of two types. These are subclassified for the feature [±ma]. [+ma] refers to those cognitive verbs which take "that" complements. These include verbs like "say", "think", "want", "love", "ask", etc. Verbs that are [-ma] take a complex complement marked by lɩ. Examples:

(15) ɔ ɓɷɓɷ -ma ñu yi ɓʌlʌ
he thinks that rain pot fall — *He thinks it will rain.*

$$\begin{bmatrix} +\text{sent-comp} \\ -\text{locative} \\ +\text{ma} \end{bmatrix}$$

(16) ɔ -wa ŋwəniaa' ɓlɩlɩ
he likes women-definite-associative sing-lɩ

He likes the women's singing.

$$\begin{bmatrix} +\text{sent-comp} \\ -\text{locative} \\ -\text{ma} \end{bmatrix}$$

The difference between these complex complements is not relevant here. Suffice it to say, however, that Hudson's system of feature complexes can adequately describe the differences in internal structure and distribution (Marchese, MS). Below is a sample set of verbs. Note that features ± ditransitive and ± sent-comp cross-classify.

(17)

		-sent (±loc included)	+sentence-comp			
			-loc		+loc	
			+ma	-ma	+kʌ	-kʌ
+transitive	-ditransitive	ñʌkʌ *measure* ŋwu *grill* ɓɪsɛ *insult* ɓɔtɔ *hit* trɨ *chase* fɪti *pierce* wɑwɔ n *melt*[8] wɔ n *wash* nu *hear* pi *cook* mʌnʌ *drink* gbʌlʌ *climb* pʌlʌ *enter* ŋwie *make cry* bɨlɨ *make fly*	ɓɑɓɑ *think* wa *love* -yi *know*	ɓɪʌ *finish* wa *love*	mʉ *go* yi *come*	-kɑ *be at* gwʉlɛ *stay*
	+ditransitive	kɪʌ *teach* pɔlɔ *pay back* nɑ *do* tra *show* ñɛ *give* mna *make/give a drink*	yɛrʌ *ask* sʉ *tell*			

[-transitive] verbs are further classified as ± plural[9] to distinguish those verbs which obligatorily take a plural subject. Most [+plural] verbs are reduplicated, since this is the normal way of forming reciprocals, while some of the [+plural] verbs consist of single stems. These verbs seem to be inherently symmetric. A set of [-transitive] predicates is sketched below:

(18)

-transitive	+plural	sʉsʉ	*speak to each other*	wa sʉsʉ	*They talk to each other.*
		wawa	*love each other*		
		jʉjlʌjʉjlʌ	*write to each other*		
		vɩ	*fight*		
		tʉtɔ	*fight back and forth*	wa tʉtɔ	*They fight.*
	-plural	ŋwi	*cry*	ɔ ŋwi	*He's crying.*
		6isio	*roll*		
		kuli	*get down*		
		ŋwɔ	*sleep*	ɔ ŋwɔ	*He's sleeping.*
		g+l+mə	*to get big*		
		kpɩmʌ	*to turn black*		
		zumə	*to multiply*		
		pʌlʌmʌ	*to get sharp*		
		6ɩsɩɔ	*to be insulted*		
		ñɩɔ	*to be given*		

Finally ± directional distinguishes those verbs which must have a directional particle. For example, the verb gʉlʉ *to get up* can never occur without the ˈkɷ particle, though ˈkɷ is a separate morpheme.[10] Other verbs like plo *hurry up* can be either ± directional.

(19) plo kɷ *Hurry up!*

gɔlɷɷ plo *canoe-the goes-fast*

Besides ˈkɷ, directional particles include ˈmʉ *inside*, -zɔ *down* sʌ *down:*

(20) ɔ 6l+- -zɔ *He fell down.*
he fell down

wɷlɷ -zɔ *Get out!*
leave bottom

ɔ ga ˈmʉ *He screamed.*
he explode inside

ɔ zɛ 'mʉ *He's reading.*
he count inside

ã̀ gʌlʌ wulu sʌ *I pray.*
I bend head down

An argument could be made for analyzing some of the above particles as nouns. 'mʉ and -zɔ for example can be possessed and occur in subject position:

(21) ñidaa' 'mʉ (pot-the-assoc-inside) *The inside of the pot*

'ɩ -zɔ pʉlʉ- -ma (its bottom is that) *Its meaning is that...*

If this analysis is accepted, verbs taking such particles could be classified as [+transitive]. The particle 'kɷ however does not act in this way. I suspect that Godié is in the middle of a historical change--that is,nouns are becoming postpositions. For the purposes of this paper, all particles are treated as if they are postpositions (rather than objects).

It may seem odd that negation has not been mentioned as part of the verbal system. The reason for this is that there is evidence that negation should be assigned to the clause rather than to the verb phrase. Negation can be marked, in fact, on the subject (rather than on the predicate) of a clause:[11]

(22) ɔ yuaa' 'lɔ -kɷ
his children-NEG there are *His children are not there.*

2. Now that the features which classify verbs have been discussed, we will now attempt to generate some verbal structures. In daughter dependency grammar, structures are generated through application of various kinds of rules. Some of the classification rules of Godié would include:

(23)

clauses

C-1 +sentence: ±imperative, ±negative
C-2 -imperative: ±interrogative

predicates

C-3 +predicate: ±finite, ±aspectual, ±transitive, ±directional
C-4 +finite: ±tense-comp
C-5 +finite, -aspectual, -transitive: ±auxiliary
C-6 +aspectual: ±completive
C-7 +transitive: ±ditransitive, ±locative, ±sent-comp

C-8 -transitive: ±plural
C-9 +locative, +sentence-comp: ±kʌ
C-10 -locative, +sent-comp: ±ma
C-11 +directional: ±kɷ, ±zɔ

Classification rules are used in conjunction with daughter dependency and sister dependency rules. In daughter dependency rules, dependency is indicated by an arrow drawn on the line from the mother to the daughter structure. One rule will be needed to generate a predicate as the daughter of a sentence node.

D-1 [+sentence, -nominal, ∝imper] ⟶ [+predicate, -∝finite]

D-1 captures the generalization that every sentence contains a full verb. The rule further specifies that if a sentence is [-imperative], the predicate will be [+finite], while a [+imperative] sentence will have a [-finite] predicate. These possibilities are outlined below:

(24)(a) $\begin{bmatrix}+\text{sentence}\\-\text{imperative}\end{bmatrix}$ | $\begin{bmatrix}+\text{predicate}\\+\text{finite}\end{bmatrix}$

(b) $\begin{bmatrix}+\text{sentence}\\+\text{imperative}\end{bmatrix}$ | $\begin{bmatrix}+\text{predicate}\\-\text{finite}\end{bmatrix}$

Once a predicate is introduced as a daughter, the pertinent classification rules can apply. For example if (a) is generated, classification rules C-3, C-4 apply. The predicate node can be further specified as [+finite], [+aspectual], [+transitive], and [-directional]. Because of the features chosen, the application of rules 5 and 8 is excluded. However, we can apply C-4, 6, and 7 yielding [-tense-comp], [+completive], [-ditransitive], [-sent-comp], [-locative]. Because of these feature specifications, rules 9-11 will have no effect. This leaves the predicate node as follows:

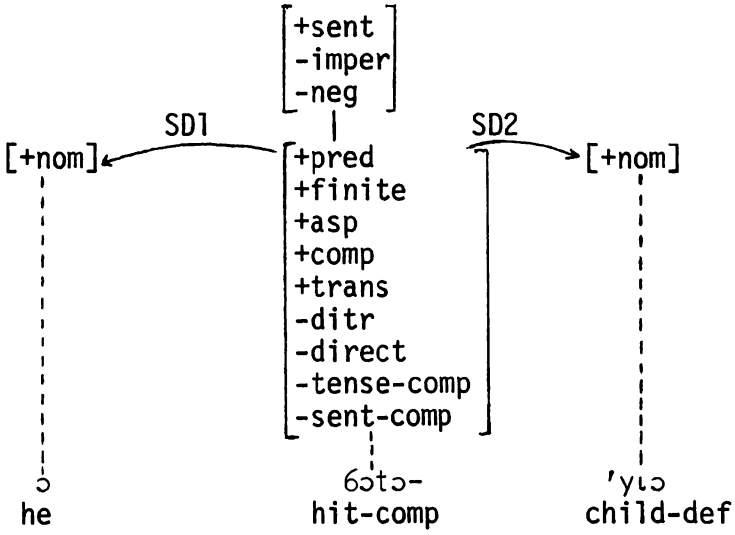
(25)
$$\begin{bmatrix}+\text{sent}\\-\text{imper}\\-\text{neg}\end{bmatrix}$$
|
$$\begin{bmatrix}+\text{pred}\\+\text{finite}\\+\text{asp}\\+\text{trans}\\+\text{completive}\\-\text{tense-comp}\\-\text{ditransitive}\\-\text{sent-comp}\\-\text{locative}\end{bmatrix}$$

Once these features have been added, sister dependency rules which are sensitive to the features on the predicate will generate dependent sisters (usually various complements). It is easy to see that in Hudson's model the predicate is viewed as central, since it determines what types of complements co-occur with it. In sister dependency rules, dependency is indicated by a raised arrow. Some of the predicate-oriented sister dependency rules include:

SD 1 [+pred, +finite] ⟶ [+nominal]
SD 2 [+trans] ⟶ [+nominal]
SD 3 [+ditrans] ⟶ [+nominal]
SD 4 [+aux] ⟶ [+pred, -finite]
SD 5 [+tense-comp] ⟶ [+tense]

Given the features on the predicate, structure (a) will undergo SD 1 and 2, but the other sister dependency rules will not apply.

(26)



He hit the child.

Nominals will of course be specified for features such as ±pronominal, ±definite, etc. Classification and dependency rules dealing with nominals are not included in this paper.

Generated structures such as (26) are unordered. Hudson proposes that the ordering of elements will be handled by sequence rules. For structure (26), two sequence rules are needed. In sequence rules a large-headed arrow denotes linear order:

S-1 [+nom ⟵ +pred, +finite] ⟩ [+pred]

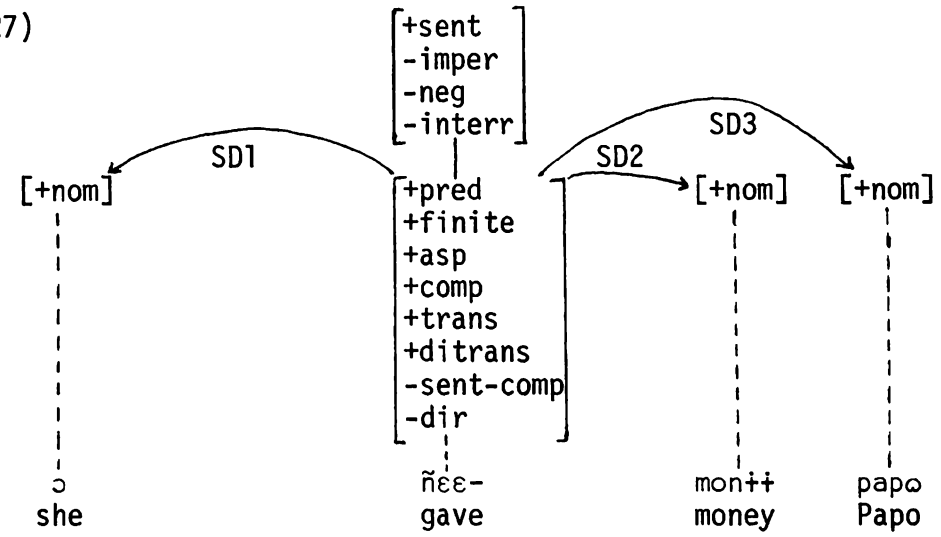
S-1 indicates that the nominal generated as a sister of [+pred, +finite] precedes the predicate.

S-2 Except for the order specified in S-1, all other sisters follow their heads.[12]

In the next section, structures of some basic verb constructions will be generated.

2.1 Ditransitives differ from structures like (26) by the presence of an additional argument. The crucial rule here is SD 3 which generates a nominal sister off of a [+ditransitive] predicate. Consider:

(27)



She gave the money to Papo.

SD 1 triggered by [+pred, +finite]
SD 2 triggered by [+trans]
SD 3 triggered by [+ditrans]

As for ordering restrictions, the sequence rule proposed for (26) also works for (27). In Godié, direct and indirect objects may occur in any order following the verb if they are full nouns. However, if one is a pronoun, it will stay closest to the verb:

(28) ɔ ñɛ nɩ papɷ
she gave it Papo *She gave it to Papo.*

This necessitates another sequence rule:[13]

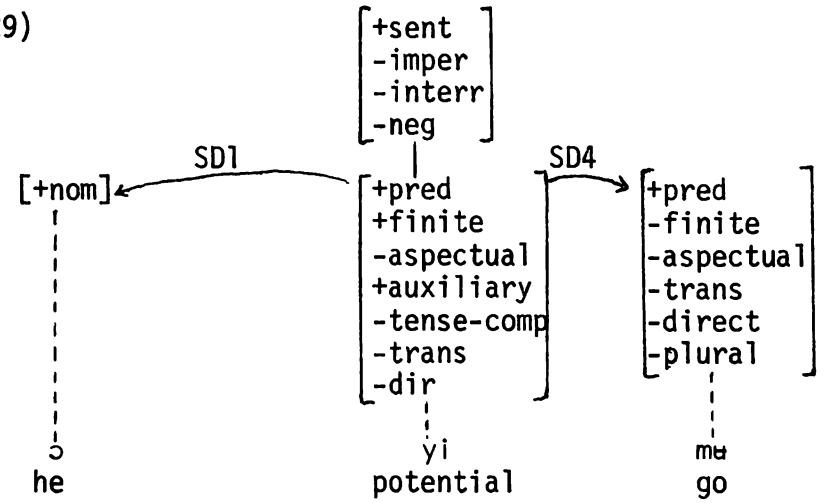
S-3 $\left[\left[\text{+nom, +pro}\right] \leftarrow \left\{\begin{matrix}\text{+ditrans}\\ \text{+trans}\end{matrix}\right\}\right] \rightarrow \left[\left[\text{+nom, -pro}\right] \leftarrow \left\{\begin{matrix}\text{+ditrans}\\ \text{+trans}\end{matrix}\right\}\right]$

However, if both are pronouns, the ditransitive pronoun precedes the transitive one:

S-4 $\left[\left[\text{+nom, +pro}\right] \leftarrow \left[\text{+ditrans}\right]\right] \rightarrow \left[\left[\text{+nom, +pro}\right] \leftarrow \left[\text{+trans}\right]\right]$

2.2 As stated in earlier sections, auxiliaries are considered finite since they take tense morphemes and object clitics. The feature [+auxiliary] will trigger a verbal complement[14] by SD 4. The following is a sample structure:

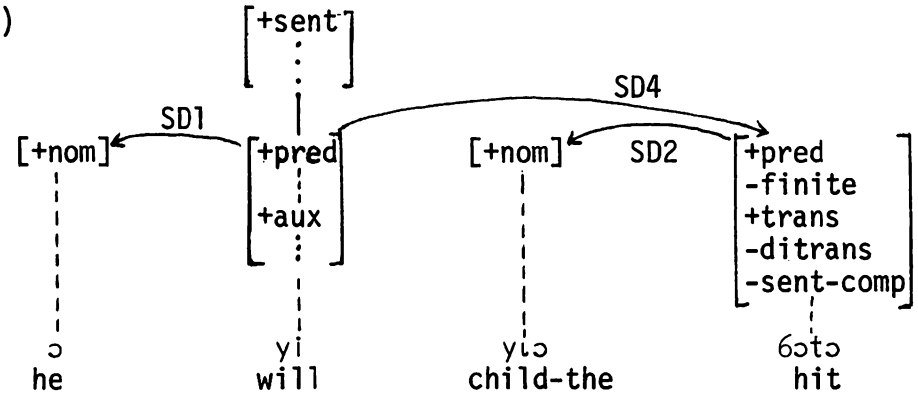
(29)



He will go.

Normally word order in Godié is SVO (note (26)), but when an AUX is present, the order is S AUX O V. Even though AUX is functioning as a finite predicate, it is the features on the second (non-finite) predicate which trigger complement nominals:

(30)



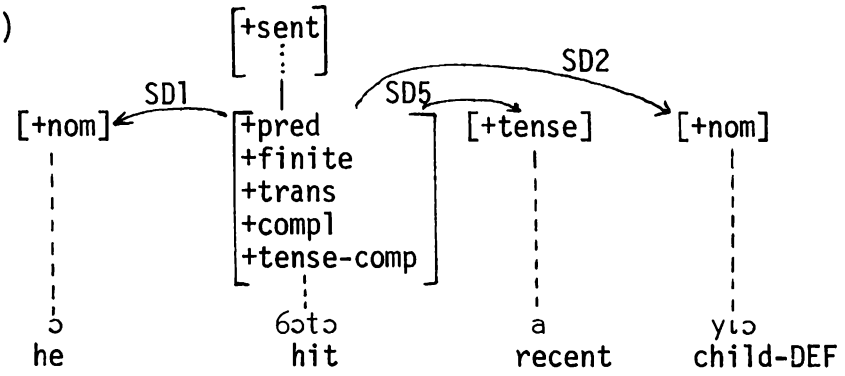
He will hit the child.

To account for word order in this case, another exception will have to be made to sequence rule 2 (dependent sisters follow their heads), stating that dependent sisters of [-finite, -imperative] predicates precede rather than follow their heads. These exceptions are to be expected since Godié is not a strict SVO language.

2.3 Tense will be a sister of the verb, generated by rule SD 5 which is sensitive to the feature [+tense-comp]. For example,

ɔ ɓɔtɔ- a yɪɔ (he hit-completive recent child-DEF) *he hit the child*, would have the following structure:

(31)



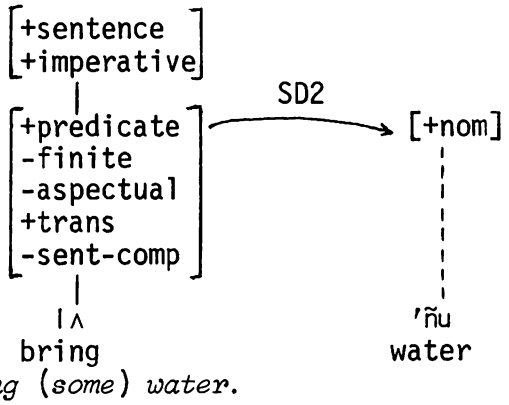
He hit the child.

A sequence rule would be needed to state that tense directly follows the predicate. However if yɪɔ is pronominalized, the object pronoun must occur closest to the verb. This means adding another sequence rule:[15]

S-5 [+tense] ⟶ [[+nom, -pro] ⟵ [+pred, +trans]]
S-6 [[+nom, +pro] ⟵ [+pred, +trans]] ⟶ [+tense]

2.4 Imperatives in Godié are distinct from other verb constructions in several ways. First they take a special negative marker aa, which distinguishes them from all other sentences, including declarative and interrogative sentences. For this reason, [+sentence] is further specified as ± imperative. Another main difference is that imperative verbs take the base tone of the verb. They cannot be inflected for aspect and do not normally take tense markers (see footnote 5). For this reason they are defined as [-finite]. This feature enables us to capture the generalization that all [-finite] verbs have the same base tone. This includes verbs following auxiliaries and those appearing in sentence-complements and compounds. As is the case with other [-finite] verbs, other predicate features such as transitive are pertinent. A simple imperative construction is shown below:

(32)



Bring (some) water.

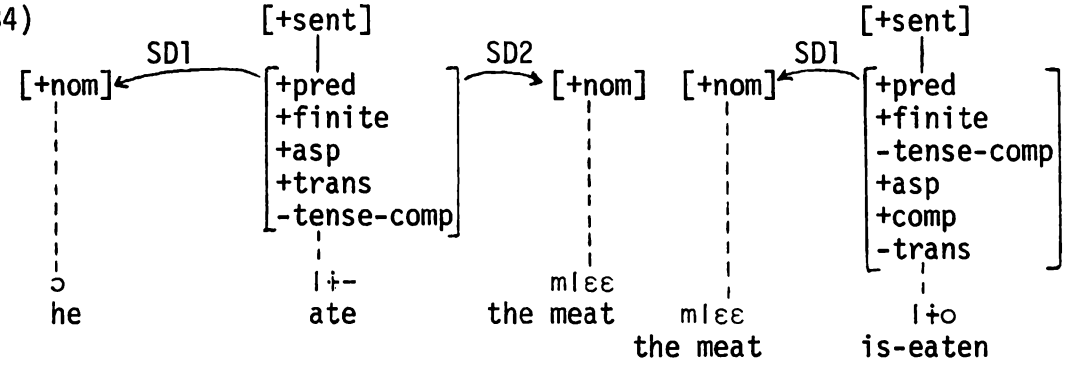
Actually some of the facts concerning imperatives are not so straight forward. For example, the same tone marking is used to indicate a subjunctive:

(33) ɔ yi
he come *He should come.*

Further research needs to be done in this area and in the area of sentence-complements before the description of the verb system is complete.

3. As the system stands, quite different structures will be generated for structures which are semantically very much alike. Consider the structures below:

(34)



In a daughter dependency grammar, these two constructions do not appear to be formally related (by a transformation, for example). However, Hudson does suggest that certain regularities can be described in the lexicon. A set of redundancy rules like those proposed by Jackendoff (1976) for the transformation model could be modified and incorporated into the grammar and would nicely account for the relatedness between the verb forms lɨ and lɨo (Schachter, class notes). Thus all active and passive forms would appear in the lexicon. Below are two sets of related verbs. Set I could be classified as [+transitive], [-sent-comp], while set II would differ by being specified [-transitive]:

Set I		Set II	
ñʌka	*measure*	ñʌkɷɔ	*to be measured*
ŋwu	*grill*	ŋwuo	*to be grilled*
6ɪsɛ	*insult*	6ɪsɪɔ	*to be insulted*
kʌn	*open*	kʌnɔ	*to be opened*
wɑwɔn	*melt*	wɑwɔnɔ	*to be melted*
wɔ n	*wash*	wɔnɔ	*to be washed*

Note that ditransitive verbs can also have corresponding intransitive forms.

'ñɛɛ *give* ñɪɔ *to be given*

Examples of these verbs:

(35) ɑ̃ ñʌka 6utuu
I measure house-Def *I'm measuring the house.*

6utuu ñʌkɷɔ
house-Def is/has been measured *The house is/has been measured.*

These two sentences will not be related through any transformational rule. Rather, a rule in the lexicon would tell us that the two verbal forms are related. This would diminish the cost of having two separate forms in the lexicon. The rule proposed would have the following shape:

R-1 (passive)

$$/X/ \quad \begin{bmatrix} +\text{pred} \\ +\text{trans} \\ \\ X(Y,Z) \\ \quad 1\ 2 \end{bmatrix} \longleftrightarrow \begin{bmatrix} +\text{pred} \\ -\text{trans} \\ \\ X(Z) \\ \quad 1 \end{bmatrix} \quad /X + ɔ/$$

The rule states that a verb with a certain phonological shape such as /lɨ/ with features [+pred, +trans] is related to another verb with the same shape, plus a suffixed ɔ,[16] which is [-trans]. X represents the verb in question; Y + Z, and, in some later cases, W, represent the arguments of the verb X. The rule further tells us that the first verb has two arguments but the second has only one. It also shows that the argument introduced by SD2 (Z) will be introduced by SD1 in the second form. This captures, in effect, the generalization that the object of the active verb has become the subject of the passive verb.

Similar rules could be introduced to account for numerous cases of verb "relatedness". The lexicalist approach would seem to be the proper way to handle these phenomena in any model. While the relationships are predictable, they are not always productive. The additional rules link stative-process pairs, reciprocals and non-reciprocals, and causative and non-causative pairs.

In Godié there is a whole set of stative verbs with adjectival meanings. These verbs take only one complement. Some of them include:

zu	*to be many*
zʌ	*to be red*
'gɨlɨ'	*to be big*
'nʌʌ	*to be good*

Almost all these verbs can become process verbs by the addition of a mʌ suffix.[17] Example:

(36) ɩ 'ɡɨlɨ' *They are big.*

ɩ ɡɨlɨmə *They are-getting-big.*

Although the addition of the mʌ suffix causes no more arguments to be added to the verb, it does change the verb from [-aspectual] (showing no inflection for the completive-incompletive distinction) to [+aspectual]. Both process and stative verbs will be listed in the lexicon and redundancy rule 3 will capture the regularity between them:

R-3

$$/X/ \quad \begin{bmatrix} +\text{pred} \\ -\text{asp} \\ -\text{trans} \\ X(Y) \\ 1 \end{bmatrix} \longleftrightarrow \begin{bmatrix} +\text{pred} \\ +\text{asp} \\ -\text{trans} \\ \underline{go}[X(Y)] \\ 1 \end{bmatrix} \quad /X+mʌ/$$

The semantic primitive go is used by Jackendoff (1976) for process verbs such as "turn red" or "melt". The list of stative verbs is quite long, and almost all of them can occur with the mʌ suffix but some do not. This again confirms the use of the lexicalist approach, since it relates already existing forms rather than "producing" them. Thus, no forms must be listed as exceptions (i.e. as not undergoing a given transformation). The process verbs which are [-transitive] can occur as causatives (i.e. as transitives). In this case, if the undergoer of the action is a pronoun, an n occurs between the verb and the pronoun. As yet, this has not been formally accounted for. An example of n is given below:

(37) ñeneya kpɩmʌ *The bananas are getting black.*
black

ɔ kpɩmʌ nɩ *He is making them black.*
he them

This correspondance will be shown by redundancy rule 4:

R-4

$$/X\text{-}mʌ/ \quad \begin{bmatrix} +\text{pred} \\ +\text{asp} \\ -\text{trans} \\ \underline{GO}\ [X\ (Y)] \\ 1 \end{bmatrix} \longleftrightarrow \begin{bmatrix} +\text{pred} \\ +\text{asp} \\ +\text{trans} \\ Z\ \underline{\text{cause}}\ [\underline{go}[(X,Y)]] \\ 1 \qquad\qquad 2 \end{bmatrix} \quad /X\text{-}mʌ\text{-}n/$$

Interestingly enough, this rule also relates a non-stative intransitive to a transitive causative:

(38) ɔ ŋwɔ *He's sleeping.*

ɔ ŋwɔ mʌ dali *He's making Dali sleep.*

Reciprocal verbs can be related to their non-reciprocal counterparts by a redundancy rule.

sʉ	sʉsʉ	*Talk/talk to each other.*
-wa	wawa	*Love/love each other.*

R-5 formalizes this relationship:

R-5

$$/X/ \longleftrightarrow /X\text{-}X/$$

$$\begin{bmatrix} +\text{pred} \\ +\text{trans} \\ \pm\text{ditrans} \\ \\ X(Y,Z) \\ 1\ 2 \end{bmatrix} \longleftrightarrow \begin{bmatrix} +\text{pred} \\ -\text{trans}^{18} \\ \\ +\text{pl} \\ \\ X(Y,Z)\cdot X(Z,Y) \\ 1\ 2 \quad\ 2\ 1 \end{bmatrix}$$

Examples:

(39) ɔ ɟuɟlʌ ñʉkpaa *He writes man-DEF.*

wa ɟʉɟlʌɟʉɟlʌ *They write to each other.*

There are several causative-non-causative verb pairs in Godié. Two lexical redundancy rules are used to relate verbs of the advanced vowel harmony set.[19]

Intransitive verbs ending in i or io are related to a causative form ending in ie. Some of these verbs are listed below:

(40)

Set I -trans		Set II +trans	
ŋwi	*cry*	ŋwie	*cause to cry*
kuli	*get down*	kulie	*get down*
6isio	*roll*	6isie	*roll*
si	*burn*	sie	*burn*
bi	*walk around*	bie	*encircle*
wəlio	*open*	wəlie	*to open*
zizio	*hide oneself*	zizie	*bury*

An example of the two sets:

(41) ɔ ŋwi *He cries.*

ɔ ŋwie dali *He makes Dali cry.*

Set I and II can be related by R-6:

R-6

$$\begin{bmatrix} -\text{trans} \\ +\text{pred} \\ \\ X(Y) \\ 1 \end{bmatrix} \longleftrightarrow \begin{bmatrix} +\text{trans} \\ +\text{pred} \\ \\ Z\ \underline{\text{cause}}[X(Y)] \\ 1 \qquad\quad 2 \end{bmatrix}$$

Set I is [-trans], while set II is [+trans]. Furthermore the subject (introduced by SD-1) of Set I occurs as the object (introduced by SD-2) of Set II. Here the semantic primitive cause is used to link semantically related forms. In R-6, Z is seen as the causative agent and the information between the brackets as the event being caused.

The following rule relates other verbs made up of advanced vowels. In this case both vowels of the verb stem are affected.[20]

R-7

$$\begin{bmatrix} +\text{pred} \\ -\text{trans} \\ X(Y) \\ 1 \end{bmatrix} \longleftrightarrow \begin{bmatrix} +\text{pred} \\ +\text{trans} \\ Z\underline{\text{cause}}[X(Y)] \\ 1 \qquad\quad 2 \end{bmatrix}$$

Examples:

budo	*bathe*	bədə	*bathe*
bulu	*fly*	bələ	*cause to fly*

(The fact that d and l occur in intervocalic position is probably significant.)

(42) nɨmənə bulu *bird flies*

ɔ bələ aviñoo *he makes-to-fly plane-def.*

Verbs containing vowels of the retracted set are related to causative verbs ending in a or another central vowel. Each set is presented below separately.[21] A set of transitive verbs is related to a ditransitive (i.e. causative) set. In this case we find:

(43)

Set I		Set II	
mʌlʌ	*drink*	mʌla	*make/give to drink*
gbʌlʌ	*climb*	gbʌla	*make to climb*

Examples:

(44) ɓaɓɨlɨ mʌlʌ 'ñu
sheep drink water

ɔ mʌla wlɨ 'ñu
he makes-drink goats water

R-8 will capture the relatedness between Sets I and II:

R-8 /X+ʌ/ /X+a/

$$\begin{bmatrix} +\text{pred} \\ +\text{trans} \\ -\text{ditrans} \\ -\text{sent-comp} \\ \\ X(Y,Z) \\ \quad 1\ 2 \end{bmatrix} \longleftrightarrow \begin{bmatrix} +\text{pred} \\ +\text{trans} \\ +\text{ditrans} \\ +\text{sent-comp} \\ \\ W\ \underline{\text{cause}}\ [X[(Y,Z)] \\ 1 \qquad\qquad 3\ 2 \end{bmatrix}$$

In set II a new argument (W) is introduced which can be viewed as the agent of the semantic primitive cause.

R-9 /Xɛ/ /Xɪʌ/

$$\begin{bmatrix} +\text{pred} \\ -\text{trans} \\ \\ X\ (Y) \\ \quad 1 \end{bmatrix} \longleftrightarrow \begin{bmatrix} +\text{pred} \\ +\text{trans} \\ \\ Z\ \underline{\text{cause}}\ [X\ (Y)] \\ 1 \qquad\quad 2 \end{bmatrix}$$

R-9 relates the following verb types:

ñɛɛ	*nurse*	ñɪʌ	*cause to nurse*
gbʌtɛ	*boil*	gbʌtɪʌ	*boil (tr)*
yɛ	*to be dry*	yɪʌ	*to dry*

Example:

gbʉglɪ ñɛɛ *Gbʉglɪ is nursing.*

anɔmɪ ñɪʌ gbʉglɪ *Anomé is nursing Gbʉglɪ.*

R-10 /X {ɔ / ɔ} / /Xʌ/

$$\begin{bmatrix} +\text{pred} \\ -\text{trans} \\ X(Y) \\ \quad 1 \end{bmatrix} \longleftrightarrow \begin{bmatrix} +\text{pred} \\ +\text{trans} \\ Z\ \text{cause}\ [X(Y)] \\ 1 \qquad\quad 2 \end{bmatrix}$$

R-10 relates non-causative verbs ending in ɷ or ɔ to their causative counterpart ending in ʌ.

Examples of verbs linked by R-10:[22]

wɷlɷ	wʌlʌ	*get out*
kpɷlɷ	kpɷlɷʌ	*clean*
tɔ	tɷʌ	*jump/bring across*

Example:

(45) sʌkpʌ tɔ — *Frog jumps.*

ɔ tɷʌ 'na sʉka — *He takes my rice across.*
he my rice

R-11 $/X \begin{Bmatrix} ɩ \\ ɷ \end{Bmatrix} / \longleftrightarrow /Xə/$

$$\begin{bmatrix} +\text{pred} \\ -\text{trans} \\ X(Y) \\ 1 \end{bmatrix} \longleftrightarrow \begin{bmatrix} +\text{pred} \\ +\text{trans} \\ Z\ \text{cause}[X(Y)] \\ 1 \qquad\quad 2 \end{bmatrix}$$

R-11 links verbs such as:[23]

vɩ	vuə	*fight/cause to fight*
bɩ	buə	*forget/cause to forget*
pɷɷ	puə	*prosper/ cause to prosper*

Examples:

(46) ɔ 'pɷɷ — *He is-in-good-health.*

ɔ puə ɔ yɩɔ — *He saved his child.*

R-12 $/Xɩ/ \longleftrightarrow /Xʉ/$

$$\begin{bmatrix} +\text{pred} \\ -\text{trans} \\ X(Y) \\ 1 \end{bmatrix} \longleftrightarrow \begin{bmatrix} +\text{pred} \\ -\text{trans} \\ Z\ \text{cause}[X(Y)] \\ 1 \qquad\quad 2 \end{bmatrix}$$

R-12 links

ñʉnʉgbɩ	ñʉnʉgbʉ	*stop*
dɩ	dʉ	*cut*

Examples:

(47) tobii ñʉnʉgbɩ — *car stand-still/stopped*
ɔ ñʉnʉgbʉ tobii — *He stopped the car.*

4. It has been shown that the daughter dependency model[24] developed by R.A. Hudson can adequately describe the verbal system in Godié. In this model the verb is seen as central since features on the verb control what dependents it can have. These features, appearing on higher nodes, allow the analyst to pinpoint the exact differences between verbal subclasses and to formulate important generalizations. Lexical redundancy rules have been used to relate verb "pairs" including passive-non-passive, causative-non-causative, and reciprocal non-reciprocal forms. This appears to be the best way of handling the data since the processes involved are not totally productive.

FOOTNOTES

[1]The dialect described here is jʉkɔwalɩ. The data come from Zadi Sassi Michel from Dakpadou.

[2]I would like to thank Paul Schachter for teaching me about daughter dependency grammar and for making comments on this paper. Any mistakes or misapplications of the model are my own.

[3]Tones are marked as follows: ' indicates high tone, - low tone, while mid tones are unmarked.

[4]Verbs which are marked as recent or remote act syntactically in exactly the same way. Therefore, the distinction, recent vs. remote, is semantic and not made part of the classification network.

[5]Actually I once found an embedded imperative that appeared to be carrying a tense. I never saw this again, and the a could have been an emphasis particle. This needs further research.

[6]This generalization can be handled by a feature addition rule stating that pronouns which are sisters of transitive, locative verbs are [+locative]. This can be formalized in the following way [+pro ⟵ +trans, +loc]: +loc.

[7]This means literally "he is at (the) clearing place". This is the typical way for many African languages to express progressives (Welmers, 73).

[8]Some verbs obligatorily take an n between the verb and the object pronoun. This phenomenon has not been described in this grammar.

[9]These verbs could be marked ±reciprocal since most of these verbs are reciprocal. The feature ± plural is used, however, to facilitate writing agreement rules.

[10]Evidence for this lies in the fact that 'kɷ is frontshifted when an auxiliary is present. gʉlʉ 'kɷ *get up* vs. ɔ yi 'kɷ gʉlʉ (he POT up get) *He will get up.*

[11]Further analysis may reveal that the high tone negation is a remnant of an auxiliary, in which case the alternative solution (assigning NEG on the verb) would be favored.

[12]In a later section, we will discuss some other exceptions to this generalization.

[13]The rule as written involves a disjunction. It states that a pronominal sister, whether a direct or indirect object must precede any full post-verbal nominal. I know of no other way to state this generalization, but it does pose a problem since Hudson wants to disallow disjunction in rules.

[14]There are several similarities between verbal complements following auxiliaries and constructions seen in (13)+(14), called sentence-comps. I hope to capture this generalization in a revised version of this paper.

[15]I am not aware of any way to collapse these two rules.

[16]Because of vowel harmony, the passive marker ɔ may be realized as o: ŋwu+ɔ = ŋwuo *grilled*. Some verb stems undergo phonological change when the ɔ passive marker is added on: ɓɪsɛ =ɓɪsɪɔ *insulted*. These changes are entirely predictable.

[17]mʌ is realized as mʌ or mə depending on the vowel harmony set of the verb stem.

[18]More research need to be done to determine if all reciprocals are -transitive.

[19]Advanced vowels include i, ɨ, u, e, ə, o, while retracted vowels include ɪ, ʉ, ʊ, ɛ, ʌ, ɔ. ɑ occurs with both vowel harmony sets.

[20]It is possible that an underlying e marker is causing centralization of the back vowels u + o: bulu +e bələ, in which case rules 6 and 7 could be collapsed.

[21]Eventually I hope to collapse many of the rules into /X/⟷/X+a/.

[22] Note there is some irregularity in this set. Some transitive verbs end in ʊʌ, while others end in ʌ. This needs further research.

[23]This is a very strange correspondance since the intransitive verbs belong to one vowel harmony set (ɪ,ʊ) and the transitive verbs to another (u,ə). The tendency for high retracted verbs to act sometimes as having an advanced underlying form has been noted in other contexts.

[24]One important aspect of Hudson's model has not been touched upon in this paper. He does allow for assignment of functions such as subject and topic (read focus).

BIBLIOGRAPHY

Hudson, R.A. 1976. Arguments for a Non-transformational Grammar, Univ. of Chicago Press.

Jackendoff, R. 1976. "An Explanatory Semantic Representation" in Linguistic Inquiry 7.1.

Marchese, L. 1976. "Subordination in Godié", MA thesis, UCLA.

Ross, J. 1967. "Auxiliaries as Main Verbs", unpublished paper, MIT.

Schachter, P. Class notes

(13) ɔ mʉ bi -kʌ
he go walk kʌ — *He goes walking.* / *He's going for a walk.* [+sent-comp, +locative, +kʌ]

(14) ɔ -kɷ slɨ dʌ
he is clear dʌ — *He is clearing.*? [+locative, +sent-comp, -kʌ]

Verbs which are [+sent-comp] but [-locative] are also of two types. These are subclassified for the feature [±ma]. [+ma] refers to those cognitive verbs which take "that" complements. These include verbs like "say", "think", "want", "love", "ask", etc. Verbs that are [-ma] take a complex complement marked by lɩ. Examples:

(15) ɔ ɓɷɓɷ -ma ñu yi ɓʌlʌ
he thinks that rain pot fall — *He thinks it will rain.*

[+sent-comp, -locative, +ma]

(16) ɔ -wa ŋwəniaa' ɓlɩlɩ
he likes women-definite-associative sing-lɩ

He likes the women's singing.

[+sent-comp, -locative, -ma]

The difference between these complex complements is not relevant here. Suffice it to say, however, that Hudson's system of feature complexes can adequately describe the differences in internal structure and distribution (Marchese, MS). Below is a sample set of verbs. Note that features ± ditransitive and ± sent-comp cross-classify.

(17)

		-sent (±loc included)	+sentence-comp			
			-loc		+loc	
			+ma	-ma	+kʌ	-kʌ
+transitive	-ditransitive	ñʌkʌ *measure* ŋwu *grill* ɓɪsɛ *insult* ɓɔtɔ *hit* trɨ *chase* fɪtɪ *pierce* wɑwɔ n *melt*[8] wɔ n *wash* nu *hear* pɪ *cook* mʌnʌ *drink* gbʌlʌ *climb* pʌlʌ *enter* ŋwie *make cry* bɨlɨ *make fly*	ɓɑɓɑ *think* wa *love* -yi *know*	ɓɪʌ *finish* wa *love*	mʉ *go* yi *come*	-kɑ *be at* gwʉlɛ *stay*
	+ditransitive	kɪʌ *teach* pɔlɔ *pay back* nɑ *do* tra *show* ñɛ *give* mna *make/give a drink*	yɛrʌ *ask* sʉ *tell*			

[-transitive] verbs are further classified as ± plural[9] to distinguish those verbs which obligatorily take a plural subject. Most [+plural] verbs are reduplicated, since this is the normal way of forming reciprocals, while some of the [+plural] verbs consist of single stems. These verbs seem to be inherently symmetric. A set of [-transitive] predicates is sketched below:

(18)

-transitive	+plural	sʉsʉ	*speak to each other*	wa sʉsʉ	*They talk to each other.*
		wawa	*love each other*		
		jʉjlʌjʉjlʌ	*write to each other*		
		vɩ	*fight*		
		tʉtɔ	*fight back and forth*	wa tʉtɔ	*They fight.*
	-plural	ŋwi	*cry*	ɔ ŋwi	*He's crying.*
		6isio	*roll*		
		kuli	*get down*		
		ŋwɔ	*sleep*	ɔ ŋwɔ	*He's sleeping.*
		gɨlɨmə	*to get big*		
		kpɩmʌ	*to turn black*		
		zumə	*to multiply*		
		pʌlʌmʌ	*to get sharp*		
		6ɩsɩɔ	*to be insulted*		
		ñɩɔ	*to be given*		

Finally ± directional distinguishes those verbs which must have a directional particle. For example, the verb gʉlʉ *to get up* can never occur without the ˈkɷ particle, though ˈkɷ is a separate morpheme.[10] Other verbs like pio *hurry up* can be either ± directional.

(19) pio kɷ *Hurry up!*

gɔlɷɷ pio *canoe-the goes-fast*

Besides ˈkɷ, directional particles include ˈmʉ *inside*, -zɔ *down* sʌ *down:*

(20) ɔ 6lɨ- -zɔ *He fell down.*
he fell down

wɷlɷ -zɔ *Get out!*
leave bottom

ɔ ga ˈmʉ *He screamed.*
he explode inside

ɔ zɛ 'mʉ *He's reading.*
he count inside

ã̀ gʌlʌ wulu sʌ *I pray.*
I bend head down

An argument could be made for analyzing some of the above particles as nouns. 'mʉ and -zɔ for example can be possessed and occur in subject position:

(21) ñidaa' 'mʉ (pot-the-assoc-inside) *The inside of the pot*

'ɩ -zɔ pʉlʉ- -ma (its bottom is that) *Its meaning is that...*

If this analysis is accepted, verbs taking such particles could be classified as [+transitive]. The particle 'kɷ however does not act in this way. I suspect that Godié is in the middle of a historical change--that is,nouns are becoming postpositions. For the purposes of this paper, all particles are treated as if they are postpositions (rather than objects).

It may seem odd that negation has not been mentioned as part of the verbal system. The reason for this is that there is evidence that negation should be assigned to the clause rather than to the verb phrase. Negation can be marked, in fact, on the subject (rather than on the predicate) of a clause:[11]

(22) ɔ yuaa' 'lɔ -kɷ
his children-NEG there are *His children are not there.*

2. Now that the features which classify verbs have been discussed, we will now attempt to generate some verbal structures. In daughter dependency grammar, structures are generated through application of various kinds of rules. Some of the classification rules of Godié would include:

(23)

clauses

C-1 +sentence: ±imperative, ±negative
C-2 -imperative: ±interrogative

predicates

C-3 +predicate: ±finite, ±aspectual, ±transitive, ±directional
C-4 +finite: ±tense-comp
C-5 +finite, -aspectual, -transitive: ±auxiliary
C-6 +aspectual: ±completive
C-7 +transitive: ±ditransitive, ±locative, ±sent-comp

C-8 -transitive: ±plural
C-9 +locative, +sentence-comp: ±kʌ
C-10 -locative, +sent-comp: ±ma
C-11 +directional: ±kɷ, ±zɔ

Classification rules are used in conjunction with daughter dependency and sister dependency rules. In daughter dependency rules, dependency is indicated by an arrow drawn on the line from the mother to the daughter structure. One rule will be needed to generate a predicate as the daughter of a sentence node.

D-1 [+sentence, -nominal, ∝imper] ⟶ [+predicate, -∝finite]

D-1 captures the generalization that every sentence contains a full verb. The rule further specifies that if a sentence is [-imperative], the predicate will be [+finite], while a [+imperative] sentence will have a [-finite] predicate. These possibilities are outlined below:

(24)(a) [+sentence, -imperative] | [+predicate, +finite]

(b) [+sentence, +imperative] | [+predicate, -finite]

Once a predicate is introduced as a daughter, the pertinent classification rules can apply. For example if (a) is generated, classification rules C-3, C-4 apply. The predicate node can be further specified as [+finite], [+aspectual], [+transitive], and [-directional]. Because of the features chosen, the application of rules 5 and 8 is excluded. However, we can apply C-4, 6, and 7 yielding [-tense-comp], [+completive], [-ditransitive], [-sent-comp], [-locative]. Because of these feature specifications, rules 9-11 will have no effect. This leaves the predicate node as follows:

(25)

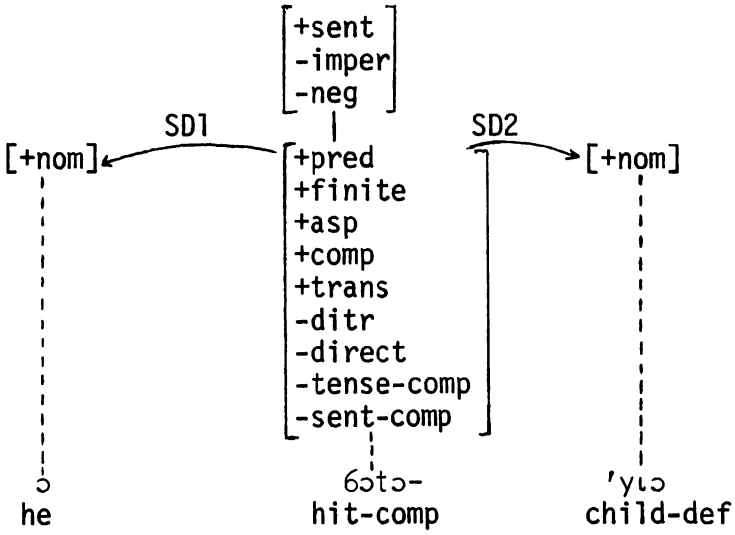
[+sent
-imper
-neg]
|
[+pred
+finite
+asp
+trans
+completive
-tense-comp
-ditransitive
-sent-comp
-locative]

Once these features have been added, sister dependency rules which are sensitive to the features on the predicate will generate dependent sisters (usually various complements). It is easy to see that in Hudson's model the predicate is viewed as central, since it determines what types of complements co-occur with it. In sister dependency rules, dependency is indicated by a raised arrow. Some of the predicate-oriented sister dependency rules include:

SD 1 [+pred, +finite] $\longrightarrow$ [+nominal]
SD 2 [+trans] $\longrightarrow$ [+nominal]
SD 3 [+ditrans] $\longrightarrow$ [+nominal]
SD 4 [+aux] $\longrightarrow$ [+pred, -finite]
SD 5 [+tense-comp] $\longrightarrow$ [+tense]

Given the features on the predicate, structure (a) will undergo SD 1 and 2, but the other sister dependency rules will not apply.

(26)



He hit the child.

Nominals will of course be specified for features such as ±pronominal, ±definite, etc. Classification and dependency rules dealing with nominals are not included in this paper.

Generated structures such as (26) are unordered. Hudson proposes that the ordering of elements will be handled by sequence rules. For structure (26), two sequence rules are needed. In sequence rules a large-headed arrow denotes linear order:

S-1 [+nom $\longleftarrow$ +pred, +finite] $\rightarrow$ [+pred]

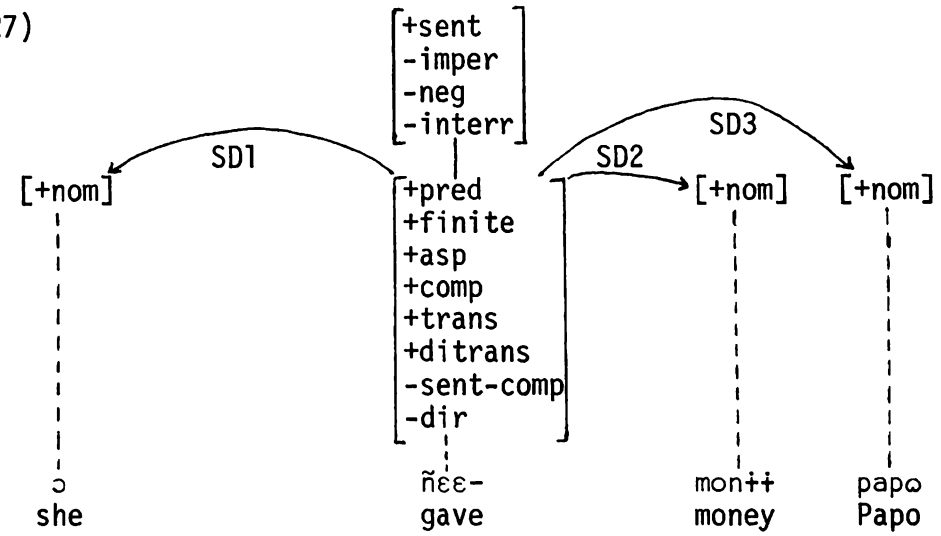
S-1 indicates that the nominal generated as a sister of [+pred, +finite] precedes the predicate.

S-2 Except for the order specified in S-1, all other sisters follow their heads.[12]

In the next section, structures of some basic verb constructions will be generated.

2.1 Ditransitives differ from structures like (26) by the presence of an additional argument. The crucial rule here is SD 3 which generates a nominal sister off of a [+ditransitive] predicate. Consider:

(27)



She gave the money to Papo.

SD 1 triggered by [+pred, +finite]
SD 2 triggered by [+trans]
SD 3 triggered by [+ditrans]

As for ordering restrictions, the sequence rule proposed for (26) also works for (27). In Godié, direct and indirect objects may occur in any order following the verb if they are full nouns. However, if one is a pronoun, it will stay closest to the verb:

(28) ɔ ñɛ nɩ papɷ
she gave it Papo *She gave it to Papo.*

This necessitates another sequence rule:[13]

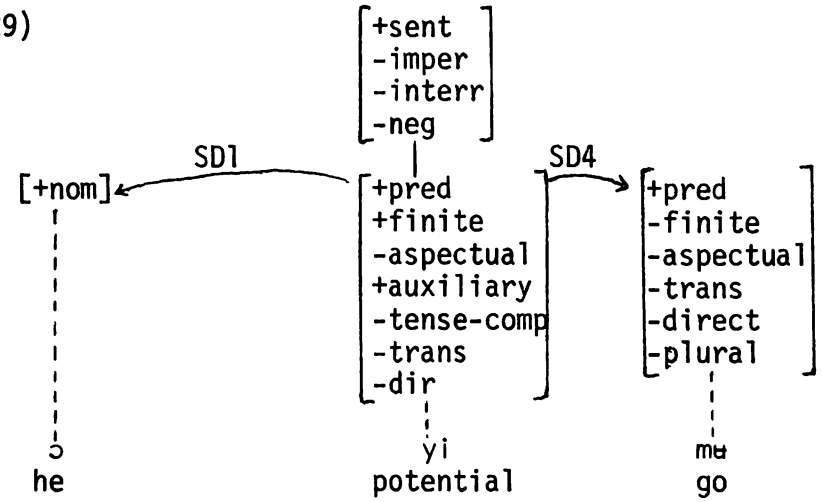
S-3 $\left[\left[+\text{nom}, +\text{pro}\right] \leftarrow \left\{\begin{matrix}+\text{ditrans}\\+\text{trans}\end{matrix}\right\}\right] \rightarrow \left[\left[+\text{nom}, -\text{pro}\right] \leftarrow \left\{\begin{matrix}+\text{ditrans}\\+\text{trans}\end{matrix}\right\}\right]$

However, if both are pronouns, the ditransitive pronoun precedes the transitive one:

S-4 $\left[\left[+\text{nom}, +\text{pro}\right] \leftarrow \left[+\text{ditrans}\right]\right] \rightarrow \left[\left[+\text{nom}, +\text{pro}\right] \leftarrow \left[+\text{trans}\right]\right]$

2.2 As stated in earlier sections, auxiliaries are considered finite since they take tense morphemes and object clitics. The feature [+auxiliary] will trigger a verbal complement[14] by SD 4. The following is a sample structure:

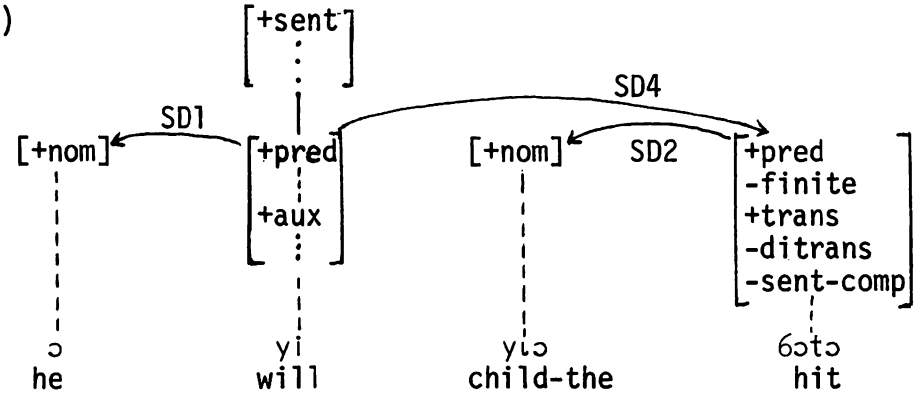
(29)



He will go.

Normally word order in Godié is SVO (note (26)), but when an AUX is present, the order is S AUX O V. Even though AUX is functioning as a finite predicate, it is the features on the second (non-finite) predicate which trigger complement nominals:

(30)



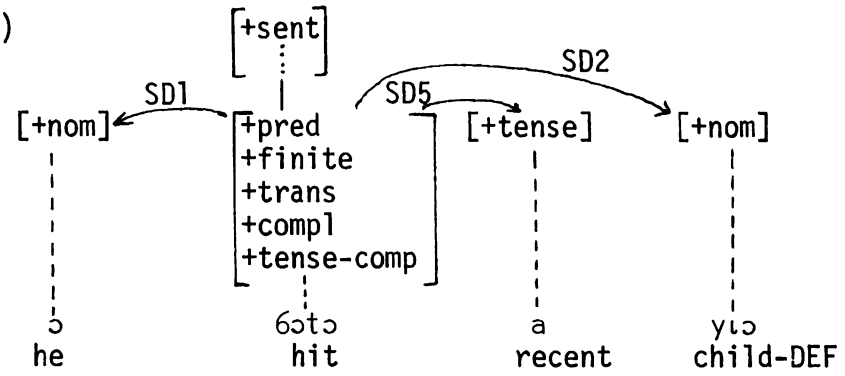
He will hit the child.

To account for word order in this case, another exception will have to be made to sequence rule 2 (dependent sisters follow their heads), stating that dependent sisters of [-finite, -imperative] predicates precede rather than follow their heads. These exceptions are to be expected since Godié is not a strict SVO language.

2.3 Tense will be a sister of the verb, generated by rule SD 5 which is sensitive to the feature [+tense-comp]. For example,

ɔ ɓɔtɔ- a yɪɔ (he hit-completive recent child-DEF) *he hit the child,* would have the following structure:

(31)



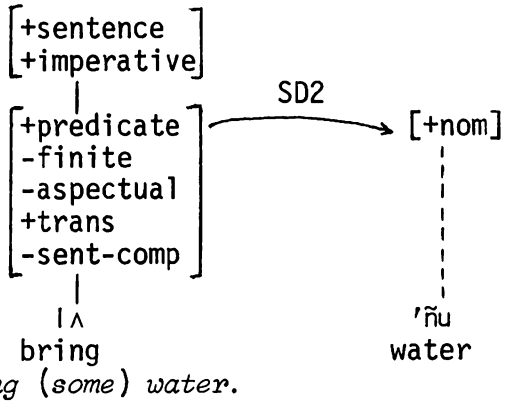
He hit the child.

A sequence rule would be needed to state that tense directly follows the predicate. However if yɪɔ is pronominalized, the object pronoun must occur closest to the verb. This means adding another sequence rule:[15]

S-5 [+tense] ⟶ [[+nom, -pro] ⟵ [+pred, +trans]]
S-6 [[+nom, +pro] ⟵ [+pred, +trans]] ⟶ [+tense]

2.4 Imperatives in Godié are distinct from other verb constructions in several ways. First they take a special negative marker aa, which distinguishes them from all other sentences, including declarative and interrogative sentences. For this reason, [+sentence] is further specified as ± imperative. Another main difference is that imperative verbs take the base tone of the verb. They cannot be inflected for aspect and do not normally take tense markers (see footnote 5). For this reason they are defined as [-finite]. This feature enables us to capture the generalization that all [-finite] verbs have the same base tone. This includes verbs following auxiliaries and those appearing in sentence-complements and compounds. As is the case with other [-finite] verbs, other predicate features such as transitive are pertinent. A simple imperative construction is shown below:

(32)



Bring (some) water.

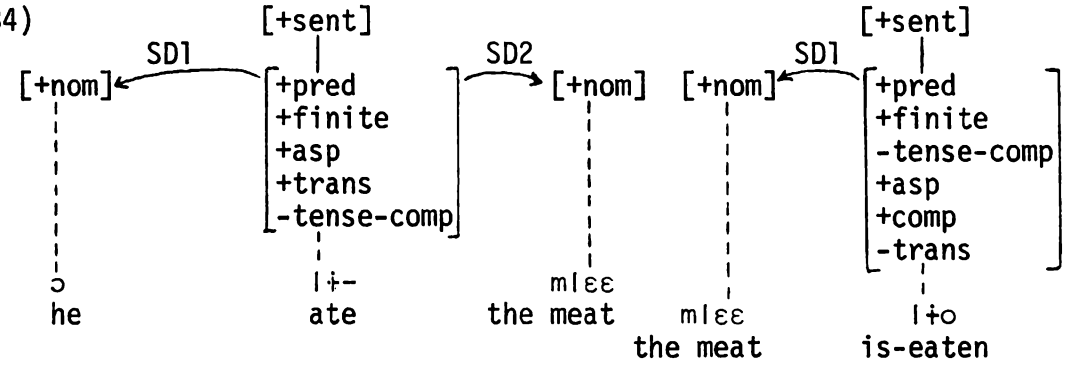
Actually some of the facts concerning imperatives are not so straight forward. For example, the same tone marking is used to indicate a subjunctive:

(33) ɔ yi
he come *He should come.*

Further research needs to be done in this area and in the area of sentence-complements before the description of the verb system is complete.

3. As the system stands, quite different structures will be generated for structures which are semantically very much alike. Consider the structures below:

(34)



In a daughter dependency grammar, these two constructions do not appear to be formally related (by a transformation, for example). However, Hudson does suggest that certain regularities can be described in the lexicon. A set of redundancy rules like those proposed by Jackendoff (1976) for the transformation model could be modified and incorporated into the grammar and would nicely account for the relatedness between the verb forms lɨ and lɨo (Schachter, class notes). Thus all active and passive forms would appear in the lexicon. Below are two sets of related verbs. Set I could be classified as [+transitive], [-sent-comp], while set II would differ by being specified [-transitive]:

Set I		Set II	
ñʌka	*measure*	ñʌkɷɔ	*to be measured*
ŋwu	*grill*	ŋwuo	*to be grilled*
6ɪsɛ	*insult*	6ɪsɪɔ	*to be insulted*
kʌn	*open*	kʌnɔ	*to be opened*
wɷwɔn	*melt*	wɷwɔnɔ	*to be melted*
wɔ n	*wash*	wɔnɔ	*to be washed*

Note that ditransitive verbs can also have corresponding intransitive forms.

'ñɛɛ *give* ñɪɔ *to be given*

Examples of these verbs:

(35) ɑ̃ ñʌka 6utuu
I measure house-Def *I'm measuring the house.*

6utuu ñʌkɷɔ
house-Def is/has been measured *The house is/has been measured.*

These two sentences will not be related through any transformational rule. Rather, a rule in the lexicon would tell us that the two verbal forms are related. This would diminish the cost of having two separate forms in the lexicon. The rule proposed would have the following shape:

R-1 (passive)

$$/X/ \quad \begin{bmatrix} +\text{pred} \\ +\text{trans} \\ \\ X(Y,Z) \\ \quad 1\ 2 \end{bmatrix} \longleftrightarrow \begin{bmatrix} +\text{pred} \\ -\text{trans} \\ \\ X(Z) \\ \quad 1 \end{bmatrix} \quad /X + ɔ/$$

The rule states that a verb with a certain phonological shape such as /lɨ/ with features [+pred, +trans] is related to another verb with the same shape, plus a suffixed ɔ,[16] which is [-trans]. X represents the verb in question; Y + Z, and, in some later cases, W, represent the arguments of the verb X. The rule further tells us that the first verb has two arguments but the second has only one. It also shows that the argument introduced by SD2 (Z) will be introduced by SD1 in the second form. This captures, in effect, the generalization that the object of the active verb has become the subject of the passive verb.

Similar rules could be introduced to account for numerous cases of verb "relatedness". The lexicalist approach would seem to be the proper way to handle these phenomena in any model. While the relationships are predictable, they are not always productive. The additional rules link stative-process pairs, reciprocals and non-reciprocals, and causative and non-causative pairs.

In Godié there is a whole set of stative verbs with adjectival meanings. These verbs take only one complement. Some of them include:

zu	*to be many*
zʌ	*to be red*
'gɨlɨ'	*to be big*
'nʌʌ	*to be good*

Almost all these verbs can become process verbs by the addition of a mʌ suffix.[17] Example:

(36) ɩ 'gɨlɨ' *They are big.*

ɩ gɨlɨmə *They are-getting-big.*

Although the addition of the mʌ suffix causes no more arguments to be added to the verb, it does change the verb from [-aspectual] (showing no inflection for the completive-incompletive distinction) to [+aspectual]. Both process and stative verbs will be listed in the lexicon and redundancy rule 3 will capture the regularity between them:

R-3

$$/X/ \quad \begin{bmatrix} +\text{pred} \\ -\text{asp} \\ -\text{trans} \\ X(Y) \\ 1 \end{bmatrix} \longleftrightarrow \begin{bmatrix} +\text{pred} \\ +\text{asp} \\ -\text{trans} \\ \underline{go}[X(Y)] \\ 1 \end{bmatrix} \quad /X+mʌ/$$

The semantic primitive go is used by Jackendoff (1976) for process verbs such as "turn red" or "melt". The list of stative verbs is quite long, and almost all of them can occur with the mʌ suffix but some do not. This again confirms the use of the lexicalist approach, since it relates already existing forms rather than "producing" them. Thus, no forms must be listed as exceptions (i.e. as not undergoing a given transformation). The process verbs which are [-transitive] can occur as causatives (i.e. as transitives). In this case, if the undergoer of the action is a pronoun, an n occurs between the verb and the pronoun. As yet, this has not been formally accounted for. An example of n is given below:

(37) ñeneya kpɩmʌ *The bananas are getting black.*
black

ɔ kpɩmʌ nɩ *He is making them black.*
he them

This correspondance will be shown by redundancy rule 4:

R-4

$$/X\text{-}mʌ/ \quad \begin{bmatrix} +\text{pred} \\ +\text{asp} \\ -\text{trans} \\ \underline{GO}\ [X\ (Y)] \\ 1 \end{bmatrix} \longleftrightarrow \begin{bmatrix} +\text{pred} \\ +\text{asp} \\ +\text{trans} \\ Z\ \underline{cause}\ [\underline{go}[(X,Y)]] \\ 1 \qquad\qquad 2 \end{bmatrix} \quad /X\text{-}mʌ\text{-}n/$$

Interestingly enough, this rule also relates a non-stative intransitive to a transitive causative:

(38) ɔ ŋwɔ *He's sleeping.*

ɔ ŋwɔ mʌ dali *He's making Dali sleep.*

Reciprocal verbs can be related to their non-reciprocal counterparts by a redundancy rule.

sʉ	sʉsʉ	*Talk/talk to each other.*
-wa	wawa	*Love/love each other.*

R-5 formalizes this relationship:

R-5

$$/X/ \longleftrightarrow /X\text{-}X/$$

$$\begin{bmatrix} +\text{pred} \\ +\text{trans} \\ \pm\text{ditrans} \\ \\ X(Y,Z) \\ \quad 1\ 2 \end{bmatrix} \longleftrightarrow \begin{bmatrix} +\text{pred} \\ -\text{trans}^{18} \\ \\ +\text{pl} \\ \\ X(Y,Z)\cdot X(Z,Y) \\ \quad 1\ 2 \quad\ 2\ 1 \end{bmatrix}$$

Examples:

(39) ɔ ɟuɟlʌ ñʉkpaa *He writes man-DEF.*

wa ɟʉɟlʌɟʉɟlʌ *They write to each other.*

There are several causative-non-causative verb pairs in Godié. Two lexical redundancy rules are used to relate verbs of the advanced vowel harmony set.[19]

Intransitive verbs ending in i or io are related to a causative form ending in ie. Some of these verbs are listed below:

(40)

Set I -trans		Set II +trans	
ŋwi	*cry*	ŋwie	*cause to cry*
kuli	*get down*	kulie	*get down*
6isio	*roll*	6isie	*roll*
si	*burn*	sie	*burn*
bi	*walk around*	bie	*encircle*
wəlio	*open*	wəlie	*to open*
zizio	*hide oneself*	zizie	*bury*

An example of the two sets:

(41) ɔ ŋwi *He cries.*

ɔ ŋwie dali *He makes Dali cry.*

Set I and II can be related by R-6:

R-6

$$\begin{bmatrix} -\text{trans} \\ +\text{pred} \\ \\ X(Y) \\ 1 \end{bmatrix} \longleftrightarrow \begin{bmatrix} +\text{trans} \\ +\text{pred} \\ \\ Z\ \underline{\text{cause}}[X(Y)] \\ 1 \qquad\quad 2 \end{bmatrix}$$

Set I is [-trans], while set II is [+trans]. Furthermore the subject (introduced by SD-1) of Set I occurs as the object (introduced by SD-2) of Set II. Here the semantic primitive cause is used to link semantically related forms. In R-6, Z is seen as the causative agent and the information between the brackets as the event being caused.

The following rule relates other verbs made up of advanced vowels. In this case both vowels of the verb stem are affected.[20]

R-7

$$\begin{bmatrix} +\text{pred} \\ -\text{trans} \\ X(Y) \\ 1 \end{bmatrix} \longleftrightarrow \begin{bmatrix} +\text{pred} \\ +\text{trans} \\ Z\underline{\text{cause}}[X(Y)] \\ 1 \qquad 2 \end{bmatrix}$$

Examples:

budo	*bathe*	bədə	*bathe*
bulu	*fly*	bələ	*cause to fly*

(The fact that d and l occur in intervocalic position is probably significant.)

(42) nɨmənə bulu *bird flies*

ɔ bələ aviñoo *he makes-to-fly plane-def.*

Verbs containing vowels of the retracted set are related to causative verbs ending in a or another central vowel. Each set is presented below separately.[21] A set of transitive verbs is related to a ditransitive (i.e. causative) set. In this case we find:

(43)

Set I		Set II	
mʌlʌ	*drink*	mʌla	*make/give to drink*
gbʌlʌ	*climb*	gbʌla	*make to climb*

Examples:

(44) ɓaɓɨlɨ mʌlʌ 'ñu
sheep drink water

ɔ mʌla wlɨ 'ñu
he makes-drink goats water

R-8 will capture the relatedness between Sets I and II:

R-8 /X+ʌ/ /X+a/

$$\begin{bmatrix} +\text{pred} \\ +\text{trans} \\ -\text{ditrans} \\ -\text{sent-comp} \\ \\ X(Y,Z) \\ \quad 1\ 2 \end{bmatrix} \longleftrightarrow \begin{bmatrix} +\text{pred} \\ +\text{trans} \\ +\text{ditrans} \\ +\text{sent-comp} \\ \\ W\ \underline{\text{cause}}\ [X[(Y,Z)] \\ 1 \qquad\qquad 3\ 2 \end{bmatrix}$$

In set II a new argument (W) is introduced which can be viewed as the agent of the semantic primitive cause.

R-9 /Xɛ/ /Xɪʌ/

$$\begin{bmatrix} +\text{pred} \\ -\text{trans} \\ \\ X\ (Y) \\ \quad 1 \end{bmatrix} \longleftrightarrow \begin{bmatrix} +\text{pred} \\ +\text{trans} \\ \\ Z\ \underline{\text{cause}}\ [X\ (Y)] \\ 1 \qquad\quad 2 \end{bmatrix}$$

R-9 relates the following verb types:

ñɛɛ	*nurse*	ñɪʌ	*cause to nurse*
gbʌtɛ	*boil*	gbʌtɪʌ	*boil (tr)*
yɛ	*to be dry*	yɪʌ	*to dry*

Example:

gbʉglɪ ñɛɛ *Gbʉglɪ is nursing.*

anɔmɪ ñɪʌ gbʉglɪ *Anomé is nursing Gbʉglɪ.*

R-10 /X {ɔ / ɔ} / /Xʌ/

$$\begin{bmatrix} +\text{pred} \\ -\text{trans} \\ X(Y) \\ \quad 1 \end{bmatrix} \longleftrightarrow \begin{bmatrix} +\text{pred} \\ +\text{trans} \\ Z\ \text{cause}\ [X(Y)] \\ 1 \qquad\quad 2 \end{bmatrix}$$

R-10 relates non-causative verbs ending in ɷ or ɔ to their causative counterpart ending in ʌ.

Examples of verbs linked by R-10:[22]

wɷlɷ	wʌlʌ	*get out*
kpɷlɷ	kpɷlɷʌ	*clean*
tɔ	tɷʌ	*jump/bring across*

Example:

(45) sʌkpʌ tɔ — *Frog jumps.*

ɔ tɷʌ 'na sʉka — *He takes my rice across.*
he my rice

R-11 /X {ɩ, ɷ} / → /Xə/

$$\begin{bmatrix} +\text{pred} \\ -\text{trans} \\ X(Y) \\ 1 \end{bmatrix} \longleftrightarrow \begin{bmatrix} +\text{pred} \\ +\text{trans} \\ Z\ \text{cause}[X(Y)] \\ 1 \qquad\quad 2 \end{bmatrix}$$

R-11 links verbs such as:[23]

vɩ	vuə	*fight/cause to fight*
bɩ	buə	*forget/cause to forget*
pɷɷ	puə	*prosper/ cause to prosper*

Examples:

(46) ɔ 'pɷɷ — *He is-in-good-health.*

ɔ puə ɔ yɩɔ — *He saved his child.*

R-12 /Xɩ/ → /Xʉ/

$$\begin{bmatrix} +\text{pred} \\ -\text{trans} \\ X(Y) \\ 1 \end{bmatrix} \longleftrightarrow \begin{bmatrix} +\text{pred} \\ -\text{trans} \\ Z\ \text{cause}[X(Y)] \\ 1 \qquad\quad 2 \end{bmatrix}$$

R-12 links ñʉnʉgbɩ — ñʉnʉgbʉ — *stop*
dɩ — dʉ — *cut*

Examples:

(47) tobii ñʉnʉgbɩ — *car stand-still/stopped*
ɔ ñʉnʉgbʉ tobii — *He stopped the car.*

4. It has been shown that the daughter dependency model[24] developed by R.A. Hudson can adequately describe the verbal system in Godié. In this model the verb is seen as central since features on the verb control what dependents it can have. These features, appearing on higher nodes, allow the analyst to pinpoint the exact differences between verbal subclasses and to formulate important generalizations. Lexical redundancy rules have been used to relate verb "pairs" including passive-non-passive, causative-non-causative, and reciprocal non-reciprocal forms. This appears to be the best way of handling the data since the processes involved are not totally productive.

FOOTNOTES

[1]The dialect described here is jrʉkɔwalɩ. The data come from Zadi Sassi Michel from Dakpadou.

[2]I would like to thank Paul Schachter for teaching me about daughter dependency grammar and for making comments on this paper. Any mistakes or misapplications of the model are my own.

[3]Tones are marked as follows: ' indicates high tone, - low tone, while mid tones are unmarked.

[4]Verbs which are marked as recent or remote act syntactically in exactly the same way. Therefore, the distinction, recent vs. remote, is semantic and not made part of the classification network.

[5]Actually I once found an embedded imperative that appeared to be carrying a tense. I never saw this again, and the a could have been an emphasis particle. This needs further research.

[6]This generalization can be handled by a feature addition rule stating that pronouns which are sisters of transitive, locative verbs are [+locative]. This can be formalized in the following way [+pro ⟵ +trans, +loc]: +loc.

[7]This means literally "he is at (the) clearing place". This is the typical way for many African languages to express progressives (Welmers, 73).

[8]Some verbs obligatorily take an n between the verb and the object pronoun. This phenomenon has not been described in this grammar.

[9]These verbs could be marked ±reciprocal since most of these verbs are reciprocal. The feature ± plural is used, however, to facilitate writing agreement rules.

[10]Evidence for this lies in the fact that 'kɷ is frontshifted when an auxiliary is present. gʉlʉ 'kɷ *get up* vs. ɔ yi 'kɷ gʉlʉ (he POT up get) *He will get up.*

[11]Further analysis may reveal that the high tone negation is a remnant of an auxiliary, in which case the alternative solution (assigning NEG on the verb) would be favored.

[12]In a later section, we will discuss some other exceptions to this generalization.

[13]The rule as written involves a disjunction. It states that a pronominal sister, whether a direct or indirect object must precede any full post-verbal nominal. I know of no other way to state this generalization, but it does pose a problem since Hudson wants to disallow disjunction in rules.

[14]There are several similarities between verbal complements following auxiliaries and constructions seen in (13)+(14), called sentence-comps. I hope to capture this generalization in a revised version of this paper.

[15]I am not aware of any way to collapse these two rules.

[16]Because of vowel harmony, the passive marker ɔ may be realized as o: ŋwu+ɔ = ŋwuo *grilled*. Some verb stems undergo phonological change when the ɔ passive marker is added on: ɓɪsɛ =ɓɪsɪɔ *insulted*. These changes are entirely predictable.

[17]mʌ is realized as mʌ or mə depending on the vowel harmony set of the verb stem.

[18]More research need to be done to determine if all reciprocals are -transitive.

[19]Advanced vowels include i, ɨ, u, e, ə, o, while retracted vowels include ɪ, ʉ, ʊ, ɛ, ʌ, ɔ. ɑ occurs with both vowel harmony sets.

[20]It is possible that an underlying e marker is causing centralization of the back vowels u + o: bulu +e bələ, in which case rules 6 and 7 could be collapsed.

[21]Eventually I hope to collapse many of the rules into /X/⟷/X+a/.

[22] Note there is some irregularity in this set. Some transitive verbs end in ʊʌ, while others end in ʌ. This needs further research.

[23]This is a very strange correspondance since the intransitive verbs belong to one vowel harmony set (ɪ,ʊ) and the transitive verbs to another (u,ə). The tendency for high retracted verbs to act sometimes as having an advanced underlying form has been noted in other contexts.

[24]One important aspect of Hudson's model has not been touched upon in this paper. He does allow for assignment of functions such as subject and topic (read focus).

BIBLIOGRAPHY

Hudson, R.A. 1976. Arguments for a Non-transformational Grammar, Univ. of Chicago Press.

Jackendoff, R. 1976. "An Explanatory Semantic Representation" in Linguistic Inquiry 7.1.

Marchese, L. 1976. "Subordination in Godié", MA thesis, UCLA.

Ross, J. 1967. "Auxiliaries as Main Verbs", unpublished paper, MIT.

Schachter, P. Class notes