MULTI-VERB CONSTRUCTIONS IN ÈDÓ: A TYPOLOGY[1]

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ABSTRACT

Multi-verb constructions provide useful insight into the question of how languages distinguish between adjunction and complementation. This paper examines multi-verb constructions in Èdó (a Benue-Congo language) with the following focus:

-Within individual languages are there different types of multi-verb construction and tests that clearly identify them?
-What are the argument sharing patterns that characterize the different types?

Four structural types of multi-verb construction in Ẹdo are shown to display different patterning with respect to the distribution of a past tense suffix –*rV*, a floating anaphor *tòbọ́rè* '*by him/her/it self* ',VP adverbs and argument sharing patterns: *V+modifier*, *V(P)+V(P)*, *V+mood* and *V+infinitival complement* constructions.
We draw main background assumptions from the following sources; implemented Head-Driven Phrase Structure Grammars for Norwegian (Hellan 2003) and Ga (Hellan 2007) a Kwa language spoken in Ghana. Two schemas are posited:

-*Verb-serial-compl (ement)-phrase* with a complementation structure for the *V (P) +V (P)* resultative and *V+infinitival complement* constructions.
-*Serial-mod-phrase* with an adjunction structure for *V+mood constructions*, *V+modifier constructions* and *V (P) +V (P)*; consequential, purpose, and negative resultative constructions.

In particular, object sharing in multi-verb constructions is analyzed as token sharing by grammatical function.

1. INTRODUCTION
Multi-verb constructions occur in many languages in four main linguistic areas in the world; West African languages, African-Caribbean Creoles, South-East Asian languages and Oceanic languages.

Amaka (2005:2) uses the following criteria to identify a typology of multi-verb constructions in West African languages:

(i)   No marking of syntactic dependency.
(ii)   At least one shared argument.
(iii)   VPs in series are seen as related.
(iv)   Each verb in the construction can function as an independent verb in a simple sentence.

The above criteria together with language specific tests such as temporal sequencing, argument linking patterns, extraction properties, scope of negation, tense, aspect and adverbial distribution patterns, have served to distinguish between "true SVCs" and other multi-verb constructions such as consecutive constructions, covert-co-ordination, overlapping constructions and co-ordination constructions. SVCs are defined by Baker and Stewart (1999:2) as clauses that have just a single tense node, but two or more verbs, with no overt markers of coordination or subordination. Furthermore they have only one overt object that seems to express the theme argument of the verbs in series and it is this property that distinguishes the class of "true" SVCs (1999:28). The term multi-verb constructions as used in this paper encompasses (i)-(iv) above with SVCs as a subclass of multi-verb constructions. Theme argument sharing is not a necessary condition for multi-verb constructions.

Multi-verb constructions in Èdó (a Benue-Congo language) exhibit the criteria listed in (i)-(iv) above. In addition they have one surface syntactic subject. Four construction types are identified: *V+modifier*, *V (P) +V (P)*, *V+mood* and *V+infinitival complement* (Ogie 2004:17-19). They are illustrated as follows:

V+modifier constructions

(1)   Òzó   vié-rè   kpèé   *(durational)*
      Ozo   cry-PST.rV   be long
      'Ozo cried for a long time'

VP+VP constructions

(2)   Òzó   suá   òré   dé   *(resultative)*
      Ozo   push.PST.H   3SG   fall.PST.H
      'Ozo pushed him/her/it down'

(3)   Òzó   dé   èbé   tìé   *(consequential)*
      Ozo   buy.PST.H   book   read
      'Ozo bought a book and read'

V+infinitival complement constructions

(4)   Íràn   kùgbé-rè   rrí   ízè   *(comitative)*
      They   join.together-PST.rV   eat   rice
      'They eat the rice together'

V+mood constructions

(5)   Òzó   mién   àkhé   guó!ghó   *(purpose)*
      Ozo   see.PST.H   pot   break.PST.H

'Ozo destroyed the pot (through a deliberate action of his)'

I discuss Baker and Stewart's (2002) and Stewart's (1998) classification of three kinds of multi-verb constructions as "true SVCS" based on their object-sharing properties: resultative SVCs, consequential SVCs and purpose constructions.
In particular I focus on their treatment of object sharing in consequential constructions as mediated by reference sharing whereby the object of V2 is *pro*. I show that object sharing is not mediated by *pro* but by token sharing by grammatical function of the NP object.

The aim of this paper is to demonstrate that different structural types of multi-verb constructions in Èdó display different patterns with respect to the distribution of a past tense suffix *–rV*, a floating anaphor *tòbọ́rè* '*by him/her/it self* ',VP adverbs and argument sharing patterns. Based on the observations, I present two schemas:
　　　-*Verb-serial-compl (ement)-phrase* with a complementation structure.
　　　-*Serial-mod-phrase* with an adjunction structure.

My analysis draws on three main sources as background assumptions; implemented Head-Driven Phrase Structure Grammars for Norwegian (Hellan 2003, Hellan and Haugereid 2004) and Ga, a Kwa language spoken in Ghana (Hellan 2007) and Hellan, Beermann and Sætherø (2003). I demonstrate how a non-*pro* based account of object sharing in multi-verb constructions can be accommodated through token sharing by grammatical function.

2. MULTI-VERB CONSTRUCTIONS IN ẸDO: IDENTIFICATION
 Baker and Stewart (2002:1) examine the syntactic properties of the following multi-verb constructions and analyze them as true SVCs; resultative constructions (2), consequential constructions (3) and purpose constructions (5).
"Table 1 from Baker and Stewart (2002:3-4) presents their properties:

Table1 Properties of SVCs(Baker and Stewart 2002)

Type	Size of VP2	Object of VP2	Attachment site	NP analog
CSVC	vP	Pro	Adjoined to vP1	Participial relative
RSVC	VP	None	Complement of V1	(Attrib. Modification)
PSVC	AspP	Wh-trace	Adjoined to AspP1	Operator relative

 Resultative Serial Verb Constructions (RSVC) is represented as a *complementation structure* with a single structural NP as the object of two verbs, the second of which is unaccusative.
Consequential Serial Verb Construction (CSVC) is represented as *a VP adjunction structure* with object sharing represented as reference sharing. The theme of V2—Vn is assigned to *pro*.

Purpose Serial Verb Construction (PSVC) is represented as an *adjunction structure whereby VP2 has an aspect/mood projection* that is adjoined to the main aspect/mood projection of VP1.

Also Stewart (1998:78-80, 267 & 295) distinguishes between the three constructions above and covert co-ordination, modal-aspectual verb constructions and Instrumental verb construction. Covert Co-ordination (CC) is represented as a conjunction of Event Phrases while the later two are analyzed as re-analyzed structures involving subordination of VP2.

In the following I present a summary of the criteria used by Baker and Stewart (2002) and Stewart (1998) in the identification of CSVCs, RSVCs, PSVCs and CCs.

CHARACTERISTICS:
Object of V2 is pro in CSVC:

    -A floating anaphor *tòbǫ́rè* 'by him/her/it self' is licensed. It is a right adjunct to an NP which may be overt or null (Baker and Stewart 2002:19-22):

(6)   Òzó   dé   ìyán dùnmwún   *pro* tòbǫ́rè *(CSVC)*
        Ozo buy.PST.H yam pound.PST.H   by.itself
        'Ozo bought the yam and pounded it by itself (the yam)'

(7)   *Òzó sùá   ògǫ́ dé   tòbǫ́rè *(RSVC)*
        Ozo push.PST.H bottle fall.PST.H   by.itself
        'Ozo pushed the bottle down by itself'

(8)   *Òzó mịén   àlìmói kpá!án   tòbǫ́rè *(PSVC)*
        Ozo find.PST.H orange pluck.PST.H by.itself
        'Ozo found an orange to pluck by itself'

    -Null object has E-type pronoun reading. This reading arises only when a pronoun is interpreted as having a non c-commanding quantified antecedent (Baker and Stewart 2002:23):

(9)   Òzó   dé   èbé khéré$_i$ tìé   *pro$_i$ (CSVC)*
        Ozo buy.PST.H book few read.PST.H
        'Ozo bought (a) few books and read (them)'

(10)   Òzó sùá   èrhán khéré dè-lé   *(RSVC)*
        Ozo push.PST.H tree few   fall-PST.PL
        'Ozo pushed (a) few trees down'

In (9) it is true Ozo bought a few books in total and read them all while in (10), the quantifier only has scope over the falling event. Ozo could have pushed many trees but only a few fell. Larson (2005) presents a similar analysis for the Empty Subject Construction in Baule. Importantly, Baule has standard null objects which Edo lacks.

Tentatively, I posit that the E-type reading of shared quantified NPs discussed above is due to the nature of object sharing: token sharing by grammatical function. This ensures that all properties of the NP are shared including scope resolution (I discuss token sharing in section three).

Subject of V2 is pro in CCs

- *Tòbọ́rè* licensed before the second verb (Stewart 1998:83-84):

(11)   *Òzó$_k$ kòkó   Àdésúwà   tòbọ́rè$_k$ mòsé (RSVC)*
       Ozo   raise.PST.H   Adesuwa   by.himself   be-beautiful.PST.H

(12)   *Òzó$_k$ lé   èvbàré tòbọ́rè$_k$ ré   pro$_j$ (CSVC)*
       Ozo   cook.PST.H   food   by.himself   eat.PST.H
       'Ozo cooked the food and he himself ate it'

(13)   *Òzó$_k$ lé   ízè̩   tòbọ́rè$_k$ rrí   ọ́rè (CC)*
       Ozo   cook.PST.H   rice   by.himself   eat.PST.H   it
       'Ozo cooked the rice and he himself ate it'

VP adjunction

-Right adjunction of N (oun)-type adverbs (Stewart 1998:47-48):

(14)   *Òzó   lé   èvbàré ègiẹ́giẹ́   ré (CSVC)*
       Ozo   cook.PST.H   food   quickly   eat.PST.H
       'Ozo cooked the food and quickly ate it'

(15)   *Òzó   sùá   ògó̩   ègiẹ́giẹ́   dé   (RSVC)*
       Ozo   push.PST.H   bottle   quickly   fall.PST.H

(16)   *Òzó   gbò̩ó̩   ívìn   ègiẹ́giẹ́ bòló   ọ́kà   (CC)*
       Ozo   plant.PST.H   coconut   quickly peel.PST.H   corn
       'Ozo planted the coconut quickly and he peeled the corn'

Inflection

In È̩dó, two verbs in a RSVC and a CSVC must match morphologically and each tense node has a unique morphological realization in a clause. This is exemplified by the Bare Stem Condition (Stewart 1998:326):

-No verb in the serial construction can bear morphological tense inflection. (Baker and Stewart 2002:15):

(17)   *Àkhé ò̩ré   Òzó   swá-rè   dé (-rè)   (RSVC)*
       pot   FOC   Ozo   push-PST.rV   fall-(PST.rV)
       'It is the pot that Ozo has pushed down'

(18)   *È̩vbàré   ò̩ré   Òzó   lé-rè   khiẹ́n(-rẹ́n)   (CSVC)*
       Food   FOC   Ozo   cook-PST.rV   sell-(PST.rV)
       'It is food that Ozo has truly cooked and sold'

-However the bare stem condition does not hold of PSVCs and CCs,

(19)   *Àlìmói ò̩ré   íràn   miẹn-rè̩n   kpá!án   (PSVC)*
       OrangeFOC   they   find-PST.rV   pluck.PST.!H
       'It is an orange that they have found to pluck'

(Stewart 1998:91):

(20)   *Èrhán ò̩ré   Òzó   khí!ín   kpàán   ívìn   (CC)*

Tree   FOC   Ozo   climb.PST.!H   pluck.PST.H   coconut
'It is a tree ozo climbed and plucked coconut'

In CCs, extraction is marked as a high-downstepped-high tone on the verb that subcategorizes for the extracted object.

Stewart's (1998) and Baker and Stewart's (1999, 2002) classification above provide a basis for classification of multi-verb constructions in this paper. However, there are two crucial areas where my analysis differs:
-The distribution of a past tense suffix marker –rV
The distributional of the –rV suffix is crucial in my classification of thirteen multi-verb constructions identified below which I analyze into four structural classes. The suffix is analyzed as licensed by the inflectional and valence property of a verb: mainly a constraint that the licensing verb has an empty COMPS list.

-The distribution and referential interpretation of the floating anaphor tòbọ́rè

   I represent *tòbọ́rè* as having an extra instigator theta role denoting a subject (Cf. Dechaine and Manfredi1994:210).

2.1 –rV SUFFIX AND MULTI-VERB CLASSIFICATION
In table 2, I present the distribution of tense in simple constructions in Ẹdo with the following representation: H (igh) (´) and L (ow) (`).
"Simplifying somewhat, tense is represented by tones in Èǵ̣dó, a past suffix –rV and a lexical item *ghá* that represents the future tense as in table 2 below.

Table2 Tense distribution in simple sentences in Ẹdo

TENSE	UNISYLL	DISYLL
<u>Simple past</u>: Transitive	dẹ́ (buy) (H)	guọ̀ghọ́ (break) (H on final vowel)
Intrans verbs/ transitive verbs with non-locally realized objects	só-rò (cry) (H-rV)	rhùlẹ́-rè (run) (H on final vowel on verb-rV)
<u>Present (habitual)</u>: Transitive	dè (L)	Guọ̀ghọ̀ (L-L)
Intransitive	só (H)	Rhùlẹ́ (H-L)
<u>Simple future</u>	ghá sò (HL)	ghá-rhú!lẹ́ (HH-!H)

In multi-verb constructions, the pattern observed in table 2 above also applies. With the exception of the past tense *-rV* suffix, the verbs in series may have the same tonal inflection for tense. I focus on the licensing of the suffix in multi-verb constructions. The suffix is made up of a consonant (r) + a vowel (V), where the form of the vowel is determined by vowel harmony with the final vowel of the verb stem. For disyllabic verbs in my data, only the tone on the final syllable is represented in my gloss.

Four structural classes of multi-verb constructions are identified with respect to licensing of –rV:

-*V+ modifier constructions*: durational, directional, locational, manner and comparative constructions.

-*V (P) +V (P) constructions*: resultatives, negative resultatives, consequential and covert co-ordination constructions.

-*V + mood constructions*: Purpose constructions.

-*V+ infinitival complement constructions*: comitative, desiderative and instrumental constructions.

V+modifier, *V+Infinitival* and *V+mood* constructions all license *rV* suffixation on V1 and have overlapping event interpretations. *V (P) +V (P)* constructions on the other hand do not license this suffix on the verbs in series as would be expected when objects are realized in non-local environment. They represent non-overlapping events (Ogie 2004:17-19).

V+modifier constructions
-rV licensed

(21) Òzó   vié-rè   fòó   *(durational)*
     Ozo   cry-PST.rV   finish.PST.H
     'Ozo finished crying'

(22) Òzó   rhùlé-rè   kpàá   *(directional)*
     Ozo   run-PST.rV   go.PST.rV
     'Ozo ran away (away from the speaker)'

(23) Òzó   mòsé-rè   sèé   Àzàrí   *(comparative)*
     Ozo   be beautiful-PST.rV   Surpass.PST.H   Azari
     'Ozo is more beautiful than Azari'

(24) Òzó   rhùlé-rè   làá   òwá   *(locational)*
     Ozo   run-PST.rV   enter.PST.H   house
     'Ozo ran into the house'

(25) Òzó   dìgién-rèn   rrí   èvbàré   *(manner)*
     Ozo   stoop-PST.rV   eat.PST.H   food
     'Ozo bent while eating'

In *V+modifier constructions*, V2 in durational, directional, comparative and locational constructions serves a modifying function and delimits the event depicted by V1. In manner constructions on the other hand V1 serves in a modifying relationship to V2. The modifying verb is a re-analyzed verb and functions as an adverbial modifier (Agheyisi 1986b:274). The suffix is licensed in this construction type as with all v+adverb constructions in the language. The modifying status of the modifying verb may be marked overtly through phonological strategies like vowel lengthening and tonal change. I use the verb *fòó "finish"* in (21) as illustration. It has a different tonal pattern when functioning as the main verb in a simple sentence as shown in examples (26) and (27) below:

(26) Ízè̩   khián   fó
     Ize   AUX (inceptive marker)   finish (main verb)
     'The rice will soon finish'
(27) *Ízè̩   khián   fòó
     Ize   AUX (inceptive marker)   finish (modifying verb-as main verb)
     'The rice will soon finish'

Also, such modifying verbs cannot take adverbial modifiers themselves:
(28) *Ò̩zó   vié̩-rè   fò̩ó   èsésè̩
     Ozo   cry-PST.rV   finish.PST.H   intensely
     'Ozo finished crying intensely'

V (P) + V (P) constructions
-rV not licensed
(29) *Àkhé   ò̩ré   Ò̩zó   swá-rè   dé (-rè)   (Resultatives)*
     pot   FOC   Ozo   push-PST.rV   fall-(PST.rV)
     'It is the pot that Ozo pushed down'
(30) *È̩vbàré   ò̩ré   Ò̩zó   lé-rè   khié̩n (-ré̩n) (consequential)*
     Food   FOC   Ozo   cook-PST.rV   sell-(PST.rV)
     'It is food that Ozo cooked and sold'
(31) *È̩bò   ò̩ré   Ò̩zó   gárè   mié̩n   òkán   (neg.result.)*
     Gods   FOC   Ozo   serve-PST.rV   receive.PST.H distress
     'It is gods Ozo served and got trouble as his reward'
(32) *È̩vbàré ò̩ré   Ò̩zó   lé-rè   khié̩n (-ré̩n)   ónrèn   (cc)*
     Food   FOC   Ozo   cook-PST.rV   sell-(PST.rV)   3SG
     'It is food that Ozo cooked and sold it'

The verbs in series in *V(P)+ V(P)* constructions have full verbal status and have the same
Tense, Aspect and Mood (TAM) values, a restriction that seems to have implication for
the non licensing of the *rV* suffix. VP adverbs modifiers may occur after VP1 as
illustrated in example (14) to (16) above. This does not apply for the resultative
construction.

V+mood constructions
-rV licensed
(33) Àkhé   ò̩ré   íràn   mie̩n-rèn   ghuó̩!ghó̩   (Purpose)
     Pot   FOC   3PL   find-PST.rV   break.PST.!H
     'It is a pot they saw to break'

The event depicted is in the realis mood a fact which seems to license the –*rV* suffix
(Baker and Stewart 2002:18). VP adverb modifiers may occur after VP1.

V+ infinitival complement constructions
-rV licensed

(34)	Íràn	kùgbé-rè		rrí	ízè̩	*(comitative)*
	They	*join. together-PST.rV*		*eat.PST.H*	*rice*	
	'They ate the rice together'					
(35)	Ò̩zó	miànmián-rè̩n		kié	è̩khú	*(desiderative)*
	Ozo	*forget-PST.rV*		*open.PST.H*	*door*	
	'Ozo forgot to open the door'					
(36)	Éhò̩	ò̩ré	Ò̩zó	rhìé-rè	fián	àlímóí *(instrumental)*
	Knife	*FOC*	*Ozo*	*take-PST.rV*	*cut.PST.H*	*orange*
	'It is a knife Ozo took to cut the orange'					

In *V+infinitival complement* constructions, V1 and V2 have different values for Tense, Aspect and Mood (TAM) and thus *-rV* is licensed. V2 occurs in an infinitival clause and an infinitival marker *yá* may occur before it. VP adverb modifiers are not licensed after V1.

I now discuss the licensing of the *rV* suffix. Manfredi (2005:16) explains *–rV* as epenthetic and the absence in past-transitive verb constructions where the objects occur in-situ as a prosodic constraint stated in (i) and (ii) below:

(i)   An inflectional pitch accent must be realized on a branching constituent within its phrase: by syntactic branching if possible, or by cv epenthesis (Insertion of weak syllable) as a last resort.

(ii)   Foot parameter (È̩dó): trochaic/right-branching i.e. *sw* or [HL].

The assumption in (i) and (ii) is that tone-marking is dependent on inflection and syllabic structure as well as a syntactic constituent structure. Manfredi (2005:17) states further that È̩dó *–re* ensures phrasal realization of the pitch accent (*(sw* or HL) denoting past aspect in a branching domain containing the root, just in case no syntactic complement is present.

Igbo, a Benue-Congo language spoken in Eastern Nigeria also has this suffix. Manfredi (2005:17) analyzes both as "segmental fill-ins, comprising a weak consonant plus a default vowel, arising as side-effects of inflectional accent and providing the minimal morphology by which past tense is achieved".

Igbo

(37)	Ḿ	rè-re	jí	(wè-é)	bya
	Isg	*sell-AFF*	*yam*	*take-AFF*	*come.AFF*
	'I sold the yams and (then) came'				

Unlike *-rV* in È̩dó, here it is licensed in all multi-verb constructions. Also, it is a pronominal clitic licensed by the verb's aktionsart that shifts information prominence over to the complement while the È̩dó counterpart ensures phrasal realization of the pitch accent (*sw* or HL) just in case no syntactic complement is present.

Manfredi's treatment of *–rV* as presented in (i) and (ii), describes the phonetic reflexes of the fact that *–rV* suffixation is licensed in part by the constraint on a verb's valence values.

In a multi-verb construction then, *-rV* is licensed by the following criteria; an empty complement list, overlapping events, one of the verbs in series is a re-analyzed verb and TAM: different mood values for V1…Vn.

2.2 CONSEQUENTIAL CONSTRUCTIONS AND THE FLOATING ANAPHOR TÒBỌ̀RÉ

Below is a characterization of the anaphor:
- Used for emphasis
- Internal structure *t*é *'to urge'*+òbọ́ *'hand' + 3 person pronoun* (Melzian1937: 133,191-192).
- Cannot occur in object position

(38)　　*Òsàrọ́　　　fián　　　　　tòbọ́rè
　　　　　 Osaro　　　 cut.PST.H　　 by.himself
　　　　　'Osaro cut by himself'

(39)　　 Òsàrọ́ fián　　　　　 ègbérè (tòbọ́rè)
　　　　　Osaro cut.PST.H　　 himself (by.himself)
　　　　　'Osaro cut himself by himself'

 The distribution of the anaphor is as follows:
Can right adjoin to any phrasal category:

(40)　　Íràn　tòbíràn　　　ghá　lè　　ízẹ̀ (Subject NP)
　　　　　They　by.themselves　FUT　cook　food
　　　　　'They themselves will cook the food
　　　　　(they will cook the food themselves, even if no one joins them in the cooking)'

(41)　　Íràn　gìẹ́gìẹ̀　　tòbíràn　　　　　lè　　　　ízẹ̀ (Adv)
　　　　　They　quickly.PRS　by.themselves　　　cook.L.PRS　food
　　　　　'They themselves are quickly cooking the food
　　　　　(someone else should have joined them)'

 (42)　　Íràn　lé　　　　ízẹ̀　vbé　ùkóní　tòbíràn (PP)
　　　　　They　cook.PST.H　rice　in　　kitchen　by.themselves
　　　　　'They cooked the rice in the kitchen by themselves
　　　　　(someone else should have joined in the cooking)'

Subject oriented analysis of tòbọ̀rè
We must have the same number and person reference as the subject

(43)　　Íràn $_i$　dẹ́　　　　ìyán$_k$　dùnmwún　　tòbíràn$_{i / *k}$ *(consequential)*
　　　　　They　buy.PST.H　yam　pound.PST.H　by.themselves
　　　　　(i)'They bought the yam and pounded it by themselves'
　　　　　(ii)'*They bought yams and pounded them by themselves (the yams)'

(44)　　*Íràn $_i$　dẹ́　　　　ìyán$_k$　dùnmwún　　tòbọ́rè$_{i / k}$
　　　　　They　buy.PST.H　yam　pound.PST.H　by.pronoun.self

(i)'They bought the yam and pounded it by themselves'
(ii)'They bought the yam and pounded it by itself'

(45)　*Íràn　dé　　　　ìyán$_k$　dùnmwún　　tòbórè $_k$
　　　They　buy.PST.H　　yam　　pound.PST.H　by.itself (the yam)
　　　'They bought the yam and pounded it by itself'

A plural object antecedent does not rescue the construction in (43ii):

(46)　*Òzó　dé　　　　ìyán　èvá $_k$　dùnmwún　　tòbíràn$_k$
　　　Ozo　buy.PST.H　　yam　two　　pound.PST.H　by. themselves (the yam)
　　　'Ozo bought two tubers of yams and pounded them by themselves'

An anaphor interpretation similar to *tòbórè* also exists in Haiti (Dechaine and Manfredi 1994:210):

(47)　Jak$_i$　benyen　　l$_{i/k}$　de　　fwa　pa jou
　　　Jak　bathe　　　3sg　two　　times　per day
　　　(i)'Jak bathes himself [all by himself] twice a day'
　　　OR (ii)'Jak bathes her/him/it twice a day'

(47i) is analyzed as implying an extra, instigator theta role, denoting a subject which acts contra to expectations on itself.

Based on these assumptions example (6) repeated below will have the following revised interpretation with object sharing represented as token sharing (I discuss this immediately below):

(48)　Òzó$_i$　dé　　　　ìyán$_k$　dùnmwún　　tòbórè$_{i/}*_k$　　*(consequential)*
　　　Ozo　buy.PST.H　　yam　pound.PST.H　by.himself
　　　'Ozo bought the yam and pounded it by himself'

3.0　ARGUMENT SHARING PATTERNS IN ẸDO MULTI-VERB CONSTRUCTIONS

In this section, I discuss first the different mapping patterns of the verbs in series and their arguments. Based on the observations, I present two schemas:
　　　-*Verb-serial-comp (lement)-phrase* with a complementation structure for the
　　　resultative and v+infinitival constructions
　　　-*Serial-mod-phrase* with an adjunction structure for the consequential, purpose
　　　and v+modifier multi-verb constructions.
The resultative, v+infinitival complement and covert-coordination do not share subject token while the consequential, purpose, negative resultatives and v+modifier constructions do. I discuss this immediately below:

3.1 ASSUMPTIONS

11

In section 2, I have argued that V2 does not license a covert object NP in consequential constructions. I show in this section how the argument selection properties of the verbs in series in multi-verb constructions are satisfied through token sharing as represented in Hellan, Beermann and Sætherø (2003:5):

Figure1 Construals of co-reference (Hellan, Beermann and Sætherø 2003)
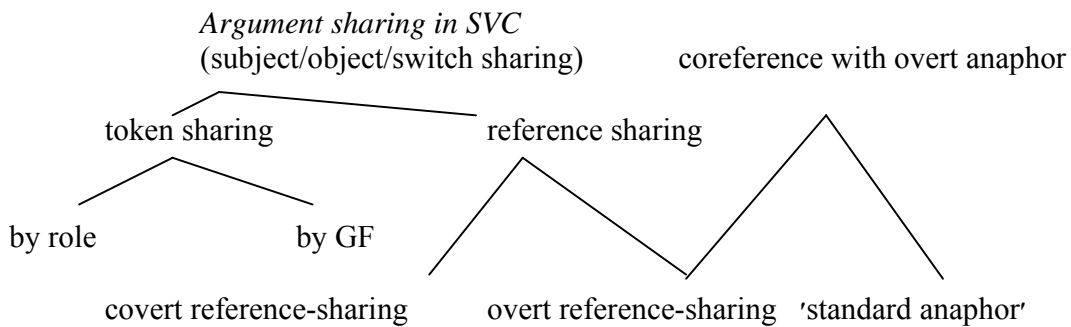
Subject sharing
Token sharing of subjects by grammatical function: In *V+ modifier, V (P) + V (P)*; consequential and negative resultatives, and, *V+mood* constructions, the verbs in series share an NP token which is syntactically realized as the subject of V1. A test confirming this is the non-licensing of the floating anaphor before V2. I illustrate with (49) below:

(49) *Òzó$_k$ vié-rè   tòbórè$_k$ fòó   *(V+modifier: durational)*
      Ozo   cry-PST.rV   by. himself   finish.PST.H
      'Ozo finished crying by himself'

(50) *Òzó$_k$ lé   èvbàré tòbórè$_k$ ré   *(V (P) +V (P): consequential)*
      Ozo   cook.PST.H   food   by.himself   eat.PST.H

(51) *Òzó$_k$ mién   àkhé   tòbórè$_k$ guó!ghó *(V+mood: purpose)*
      Ozo   see.PST.H   pot   by.himself   break.PST.!H

Reference sharing of subjects
The NP which bears the grammatical function of subject to V1 shares referential index with a covert subject of V2 in *V+ infinitival complement* constructions. Thus the floating anaphor is licensed before V2:

(52) Íràn$_k$ kùgbé-rè   tòbíràn$_k$ rrí   ízè *(comitative)*
      They   join. together-PST.rV by.themselves eat.PST.H   rice
      'They ate the rice together by themselves'

  This applies also for covert coordination (see (13) above).

Switch sharing
In resultative constructions, the NP which bears the grammatical function of direct object to V1 and is realized in its canonical object position also bears the subject grammatical function to V2.The floating anaphor is not licensed before V2:

(53) *Òzó$_k$ kòkó   Àdésúwà   tòbórè$_k$ mòsé *(resultatives)*

Object sharing by grammatical function (GF)
A participant role, for example a theme role, is realized by a GF associated with V2, but is not realized by an NP in the position in which an object relative to it would occur. Instead, the GF is realized as a GF relative toV1. V1 supports an NP with the referent in question (Hellan, Beermann and Sætherø 2003:12-13). Consequential constructions and *V+mood* constructions exhibit token sharing of objects. I illustrate with (54) below:

(54) Òzó   dé̱   ìyán   dùnmwún   *(consequential)*
      Ozo   buy.PST.H   yam   pound.PST.H
      'Ozo bought the yam and pounded it'

Objects are not shared
In covert co-ordination, V1 and V2 may each have objects occurring as their complements which may or may not share reference:

(55) Òzó   dé̱   ízè̱$_k$ rrí   òré̱$_k$
      Ozo   buy.PST.H   rice   eat.PST.H   it
      'Ozo bought rice and ate it'
(56) Òzó   lé   ízè̱$_j$ kpòló   òwá$_k$
      Ozo   cook.PST.H   rice   sweep.PST.H   house
      'Ozo cooked rice and swept the house'

Also, in *V+ infinitival complement* and negative resultative constructions objects are not shared (if any).
The discussion so far in this paper is summed up in table three below:
Table3 Properties of multi-verb constructions in E̱do

Construction type	rVsuffixation	Floating anaphor before V(P)2	VP Adjuncts After V(P) 1	Token Sharing of subjects	Switch sharing	Reference sharing Of subjects	Token Sharing Of objects	Objects are not shared
V+modifier	Yes	No	No	Yes	No	No	Not applicable	Not applicable
V(P)+V(P): Resultatives	No	No	No	No	Yes	No	No	Yes
Consequential	No	No	Yes	Yes	No	No	Yes	No
Neg.resultatives	No	No	Yes	Yes	No	No	No	Yes
Covert-coordination	No	Yes	Yes	No	No	Yes	No	Yes
V+mood	Yes	No	Yes	Yes	No	No	Yes	No
V+infinitival complement	Yes	Yes	No	No	No	Yes	No	Yes

3.2 FORMAL REPRESENTATION
I use the standard HPSG typed feature-value formalism. However, different from standard HPSG assumptions is the representation of grammatical functions in the category information on signs through the attribute Q (UALITATIVE) VAL (ENCE) constraining the type *cat (egory)* (Hellan 2003:16-23). Unification of referential indices

ensures uniformity of information across attributes values. The use of boxed numerals called *tags* '[1]' captures identity (re-entrancy or co-indexation).
I focus on argument sharing in resultative and consequential constructions but the analysis can be extended to the other construction types.

For both construction types, events in series express an over all macro event and is represented as an attribute SITPAIR-COND (TION) constraining *mrs* (Hellan, Beermann and Sætherø 2003:10). This is illustrated in the AVM in appendix 1.

To express temporal relations, I have introduced an attribute NON-OVERLAP with value *bool (ean)* as an additional constraint on *sitpair-cond* (see appendix 1).

Hellan (2007 Ga tdl) analyzes serial verbs in Ga into two schemas:
-*Head-verb-isvc-switchsharing-phrase* with a complementation structure: the referential index value of the NP subject of non-head-daughter is identified with the referential index value of the NP that is the direct object of the head-daughter and the head-daughter and mother qval values are identified. The non-head-daughter is a complement of the head-daughter.

-*Verb-serial-mod-phrase* with adjunction structure: the head-daughter is realized as a value of an attribute MOD (IFIED) that constrains the non-head-daughter's head. The referential index values for the head-daughter's subject and non-head-daughter's are identified and the head-daughter's qval value is also identified with the mother's.

The analyses presented in the AVMs in appendices 2 to 5 reflect the assumptions above. The type *verb-serial-compl-phrase* (see appendix 2) has the same assumptions as the *head-verb-isvc-switchsharing-phrase*, however, the head-daughter's COMP and direct object is unspecified to allow for inheritance for types constraining the *resultative-verb-serial-compl-phrase* (see appendix 3)and the *v+infinitival-verb-serial-compl-phrase*(I do not discuss the latter in this paper).

The *type Resultative-verb-serial-compl-phrase* as shown in the AVM in appendix 3 inherits from the *verb-serial-compl-phrase*. The referential index values of the direct-object of the head-daughter is identified with that of the non-head-daughter's subject and the value for NON-OVERLAP is declared as [+].

The type *Consequential-verb-serial-mod-phrase* inherits from *verb-serial-mod-phrase*. I have identified the values of the direct object of the head-daughter with that of the non-head-daughter's direct object and the NP bearing the referential index is the head-daughter's COMP value. This is illustrated in AVMs in appendix 5 and 4 respectively.

4.0 CONCLUSION
In this paper, I have established four structural types of multi-verb constructions in Èdó; *V+modifier,V+mood,V+infinitival complement* and *V(P)+V(P)* constructions based on

criteria such as adverb modification, licensing of floating anaphors, argument sharing patterns and the licensing of a past tense suffix *rV*.

I have also examined Stewart's (1998) and Baker and Stewart's (2002) analyses of SVCs in Èdó and their claim of a pronominal element *pro* as the object of V2 in a Consequential Serial Verb Construction. An alternative analysis based on token sharing of NPs is given. Finally, I have presented two schemas*: verb-serial-compl- phrase* and *Verb-serial-mod-phrase*. The former describes a complementation structure constraining the resultative and *v+infinitival complement* constructions and the latter an adjunction constraining the consequential, purpose, negative resultative and *V+modifier* constructions.

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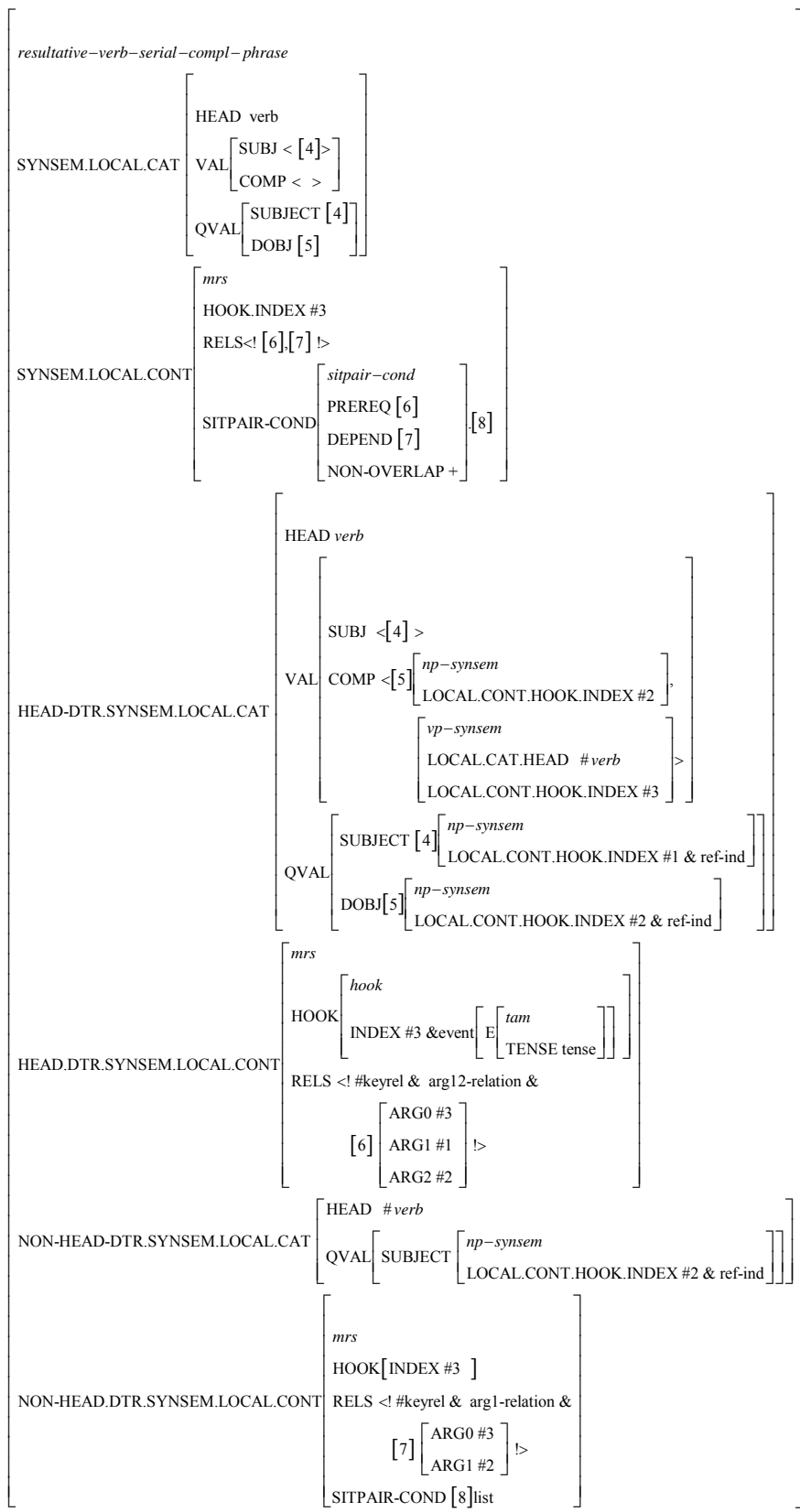
APPENDIX 1. SITPAIR-CONDITION.

$$
\begin{bmatrix}
mrs \\
\text{SITPAIR-COND}
\begin{bmatrix}
sitpair-cond \\
\text{PREREQ relation} \\
\text{DEPEND relation} \\
\text{NON-OVERLAP } bool
\end{bmatrix}.list
\end{bmatrix}
$$

APPENDIX 2. VERB-SERIAL-COMPL-PHRASE.

$$
\begin{bmatrix}
verb-serial-compl-phrase \\[4pt]
\text{SYNSEM.LOCAL.CAT}
\begin{bmatrix}
\text{HEAD verb} \\
\text{VAL}
\begin{bmatrix}
\text{SUBJ} < [1] > \\
\text{COMP} < \ >
\end{bmatrix} \\
\text{QVAL}[\text{SUBJECT }[1]]
\end{bmatrix} \\[4pt]
\text{SYNSEM.LOCAL.CONT}
\begin{bmatrix}
mrs \\
\text{HOOK.INDEX \#3} \\
\text{RELS}<! [4],[5] !> \\
\text{SITPAIR-COND}
\begin{bmatrix}
sitpair-cond \\
\text{PREREQ }[4] \\
\text{DEPEND }[5] \\
\text{NON-OVERLAP } bool
\end{bmatrix}.[6]
\end{bmatrix} \\[4pt]
\text{HEAD-DTR.SYNSEM.LOCAL.CAT}
\begin{bmatrix}
\text{HEAD}[verb] \\
\text{VAL}
\begin{bmatrix}
\text{SUBJ} < [1] > \\
\text{COMP} <
\begin{bmatrix}
vp-synsem \\
\text{LOCAL.CAT.HEAD \#verb} \\
\text{LOCAL.CONT.HOOK.INDEX \#3}
\end{bmatrix} >
\end{bmatrix} \\
\text{QVAL}\left[\text{SUBJECT }[1]\begin{bmatrix}np-synsem \\ \text{LOCAL.CONT.HOOK.INDEX \& ref-ind}\end{bmatrix}\right]
\end{bmatrix} \\[4pt]
\text{HEAD.DTR.SYNSEM.LOCAL.CONT}
\begin{bmatrix}
mrs \\
\text{HOOK}\begin{bmatrix}hook \\ \text{INDEX \#3 \&event}\begin{bmatrix}E\begin{bmatrix}tam \\ \text{TENSE tense}\end{bmatrix}\end{bmatrix}\end{bmatrix} \\
\text{RELS} <! \text{ keyrel \& event-relation\&} \\
\quad [4]\ [\text{ARG0 \#3}]\ !>
\end{bmatrix} \\[4pt]
\text{NON-HEAD-DTR.SYNSEM.LOCAL.CAT}
\begin{bmatrix}
\text{HEAD \# verb} \\
\text{VAL}\left[\text{SUBJ} <\begin{bmatrix}np-synsem \\ \text{LOCAL.CONT.HOOK.INDEX \#2}\end{bmatrix} >\right] \\
\text{QVAL}\left[\text{SUBJECT}\begin{bmatrix}np-synsem \\ \text{LOCAL.CONT.HOOK.INDEX \#2 \& ref-ind}\end{bmatrix}\right]
\end{bmatrix} \\[4pt]
\text{NON-HEAD.DTR.SYNSEM.LOCAL.CONT}
\begin{bmatrix}
mrs \\
\text{HOOK}\begin{bmatrix}hook \\ \text{INDEX \#3}\end{bmatrix} \\
\text{RELS} <! \text{ keyrel \& event-relation\&} \\
\quad [5]\ [\text{ARG0 \#3}]\ !> \\
\text{SITPAIR-COND }[6]\text{list}
\end{bmatrix}
\end{bmatrix}
$$

APPENDIX 3. RESULTATIVE-VERB-SERIAL-COMPL-PHRASE.

$$
\begin{bmatrix}
\textit{resultative−verb−serial−compl−phrase} \\[4pt]
\text{SYNSEM.LOCAL.CAT}
\begin{bmatrix}
\text{HEAD } \text{verb} \\
\text{VAL}\begin{bmatrix} \text{SUBJ} < [4]> \\ \text{COMP} < \; > \end{bmatrix} \\
\text{QVAL}\begin{bmatrix} \text{SUBJECT } [4] \\ \text{DOBJ } [5] \end{bmatrix}
\end{bmatrix} \\[20pt]
\text{SYNSEM.LOCAL.CONT}
\begin{bmatrix}
\textit{mrs} \\
\text{HOOK.INDEX \#3} \\
\text{RELS} <! \; [6],[7] \; !> \\
\text{SITPAIR-COND}
\begin{bmatrix}
\textit{sitpair−cond} \\
\text{PREREQ } [6] \\
\text{DEPEND } [7] \\
\text{NON-OVERLAP } +
\end{bmatrix} , [8]
\end{bmatrix} \\[30pt]
\text{HEAD-DTR.SYNSEM.LOCAL.CAT}
\begin{bmatrix}
\text{HEAD } \textit{verb} \\
\text{VAL}
\begin{bmatrix}
\text{SUBJ } <[4] > \\
\text{COMP} <[5]\begin{bmatrix} \textit{np−synsem} \\ \text{LOCAL.CONT.HOOK.INDEX \#2} \end{bmatrix} , \\
\begin{bmatrix} \textit{vp−synsem} \\ \text{LOCAL.CAT.HEAD } \#\textit{verb} \\ \text{LOCAL.CONT.HOOK.INDEX \#3} \end{bmatrix} >
\end{bmatrix} \\
\text{QVAL}
\begin{bmatrix}
\text{SUBJECT } [4]\begin{bmatrix} \textit{np−synsem} \\ \text{LOCAL.CONT.HOOK.INDEX \#1 \& ref-ind} \end{bmatrix} \\
\text{DOBJ} [5]\begin{bmatrix} \textit{np−synsem} \\ \text{LOCAL.CONT.HOOK.INDEX \#2 \& ref-ind} \end{bmatrix}
\end{bmatrix}
\end{bmatrix} \\[30pt]
\text{HEAD.DTR.SYNSEM.LOCAL.CONT}
\begin{bmatrix}
\textit{mrs} \\
\text{HOOK}\begin{bmatrix} \textit{hook} \\ \text{INDEX \#3 \&event}\begin{bmatrix} \text{E}\begin{bmatrix} \textit{tam} \\ \text{TENSE tense} \end{bmatrix} \end{bmatrix} \end{bmatrix} \\
\text{RELS} <! \; \#\text{keyrel \& arg12-relation \&} \\
\quad [6]\begin{bmatrix} \text{ARG0 \#3} \\ \text{ARG1 \#1} \\ \text{ARG2 \#2} \end{bmatrix} !>
\end{bmatrix} \\[30pt]
\text{NON-HEAD-DTR.SYNSEM.LOCAL.CAT}
\begin{bmatrix}
\text{HEAD } \#\textit{verb} \\
\text{QVAL}\begin{bmatrix} \text{SUBJECT}\begin{bmatrix} \textit{np−synsem} \\ \text{LOCAL.CONT.HOOK.INDEX \#2 \& ref-ind} \end{bmatrix} \end{bmatrix}
\end{bmatrix} \\[30pt]
\text{NON-HEAD.DTR.SYNSEM.LOCAL.CONT}
\begin{bmatrix}
\textit{mrs} \\
\text{HOOK}\begin{bmatrix} \text{INDEX \#3} \end{bmatrix} \\
\text{RELS} <! \; \#\text{keyrel \& arg1-relation \&} \\
\quad [7]\begin{bmatrix} \text{ARG0 \#3} \\ \text{ARG1 \#2} \end{bmatrix} !> \\
\text{SITPAIR-COND } [8]\text{list}
\end{bmatrix}
\end{bmatrix}
$$

APPENDIX 4. VERB-SERIAL-MOD-PHRASE.

$$
\begin{bmatrix}
verb-serial-\text{mod}-phrase \\[4pt]
\text{SYNSEM.LOCAL.CAT}
\begin{bmatrix}
\text{HEAD } \#verb \\
\text{VAL}
\begin{bmatrix}
\text{SUBJ} < \boxed{2} > \\
\text{COMP} < \ >
\end{bmatrix} \\
\text{QVAL}\begin{bmatrix}\text{SUBJECT } \boxed{2}\end{bmatrix}
\end{bmatrix} \\[30pt]

\text{SYNSEM.LOCAL.CONT}
\begin{bmatrix}
mrs \\
\text{HOOK.INDEX } \#1 \\
\text{RELS} <! \ \boxed{3},\boxed{4}\ !> \\
\text{SITPAIR-COND}
\begin{bmatrix}
sitpair-cond \\
\text{PREREQ }\boxed{3} \\
\text{DEPEND }\boxed{4} \\
\text{NON-OVERLAP bool}
\end{bmatrix}.\boxed{5}
\end{bmatrix} \\[40pt]

\text{HEAD-DTR.SYNSEM.LOCAL.CAT}
\begin{bmatrix}
\text{HEAD } \#verb \\
\text{VAL}\begin{bmatrix}\text{SUBJ } <\boxed{2}>\end{bmatrix} \\
\text{QVAL}\begin{bmatrix}\text{SUBJECT }\boxed{2}\begin{bmatrix}np-synsem \\ \text{LOCAL.CONT.HOOK.INDEX ref-ind}\end{bmatrix}\end{bmatrix}
\end{bmatrix} \\[40pt]

\text{HEAD.DTR.SYNSEM.LOCAL.CONT}
\begin{bmatrix}
mrs \\
\text{HOOK}\begin{bmatrix}hook \\ \text{INDEX } \#1\ \&event\begin{bmatrix}\text{E}\begin{bmatrix}tam \\ \text{TENSE tense}\end{bmatrix}\end{bmatrix}\end{bmatrix} \\
\text{RELS} <! \text{ keyrel } \& \text{ event-relation}\& \\
\quad \boxed{3}\begin{bmatrix}\text{ARG0 }\#1\end{bmatrix} !>
\end{bmatrix} \\[40pt]

\text{NON-HEAD-DTR.SYNSEM.LOCAL.CAT}
\begin{bmatrix}
\text{HEAD}\begin{bmatrix}verb \\ \text{MOD}<\begin{bmatrix}\text{SYNSEM.LOCAL.CAT.HEAD }\#verb \\ \text{SYNSEM.LOCAL.CONT.HOOK.INDEX }\#1\end{bmatrix}> \end{bmatrix} \\
\text{QVAL}\begin{bmatrix}\text{SUBJECT }\boxed{2}\end{bmatrix}
\end{bmatrix} \\[40pt]

\text{NON-HEAD.DTR.SYNSEM.LOCAL.CONT}
\begin{bmatrix}
mrs \\
\text{HOOK}\begin{bmatrix}hook \\ \text{INDEX } \#1\end{bmatrix} \\
\text{RELS} <! \text{ keyrel } \& \text{ event-relation}\& \\
\quad \boxed{4}\begin{bmatrix}\text{ARG0 }\#1\end{bmatrix} !> \\
\text{SITPAIR-COND }\boxed{5}\text{list}
\end{bmatrix}
\end{bmatrix}
$$

APPENDIX 5. CONSEQUENTIAL-VERB-SERIAL-MOD-PHRASE.

$$
\begin{bmatrix}
consequential-verb-serial-\mathrm{mod}-phrase \\[4pt]
\text{SYNSEM.LOCAL.CAT}
\begin{bmatrix}
\text{HEAD \ \#verb} \\[4pt]
\text{VAL}
\begin{bmatrix}
\text{SUBJ} < [4]> \\
\text{COMP} < \ >
\end{bmatrix} \\[12pt]
\text{QVAL}
\begin{bmatrix}
\text{SUBJECT } [4] \\
\text{DOBJ.SYNSEM.LOCAL.CAT.VAL.COMP } [5]
\end{bmatrix}
\end{bmatrix} \\[24pt]
\text{SYNSEM.LOCAL.CONT}
\begin{bmatrix}
mrs \\
\text{HOOK.INDEX \#3} \\
\text{RELS} <! [6],[7] !> \\[4pt]
\text{SITPAIR-COND}
\begin{bmatrix}
sitpair-cond \\
\text{PREREQ } [6] \\
\text{DEPEND } [7] \\
\text{NON-OVERLAP } +
\end{bmatrix}.[8]
\end{bmatrix} \\[24pt]
\text{HEAD-DTR.SYNSEM.LOCAL.CAT}
\begin{bmatrix}
\text{HEAD \#verb} \\
\text{VAL}
\begin{bmatrix}
\text{SUBJ } <[4] > \\
\text{COMP } <[5] >
\end{bmatrix} \\[4pt]
\text{QVAL}
\begin{bmatrix}
\text{SUBJECT } [4]
\begin{bmatrix}
np-synsem \\
\text{LOCAL.CONT.HOOK.INDEX \#1 \& ref-ind}
\end{bmatrix} \\
\text{DOBJ } [5]
\begin{bmatrix}
np-synsem \\
\text{LOCAL.CONT.HOOK.INDEX \#2 \& ref-ind}
\end{bmatrix}
\end{bmatrix}
\end{bmatrix} \\[24pt]
\text{HEAD.DTR.SYNSEM.LOCAL.CONT}
\begin{bmatrix}
mrs \\
\text{HOOK}
\begin{bmatrix}
hook \\
\text{INDEX \#3 \&event}
\begin{bmatrix}
E
\begin{bmatrix}
tam \\
\text{TENSE tense}
\end{bmatrix}
\end{bmatrix}
\end{bmatrix} \\
\text{RELS} <! \text{keyrel \& arg12-relation\&} \\
\quad [6]
\begin{bmatrix}
\text{ARG0 \#3} \\
\text{ARG1 \#1} \\
\text{ARG2 \#2}
\end{bmatrix} !>
\end{bmatrix} \\[24pt]
\text{NON-HEAD-DTR.SYNSEM.LOCAL.CAT}
\begin{bmatrix}
\text{HEAD}
\begin{bmatrix}
verb \\
\text{MOD}<
\begin{bmatrix}
\text{SYNSEM.LOCAL.CAT.HEAD \#verb} \\
\text{SYNSEM.LOCAL.CONT.HOOK.INDEX \#3}
\end{bmatrix}>
\end{bmatrix} \\[4pt]
\text{QVAL}
\begin{bmatrix}
\text{SUBJECT } [4] \\
\text{DOBJ } [5]
\end{bmatrix}
\end{bmatrix} \\[24pt]
\text{NON-HEAD.DTR.SYNSEM.LOCAL.CONT}
\begin{bmatrix}
mrs \\
\text{HOOK}
\begin{bmatrix}
hook \\
\text{INDEX \#3}
\end{bmatrix} \\
\text{RELS} <! \text{keyrel \& arg12-relation\&} \\
\quad [7]
\begin{bmatrix}
\text{ARG0 \#3} \\
\text{ARG1 \#1} \\
\text{ARG2 \#2}
\end{bmatrix} !> \\
\text{SITPAIR-COND } [8] \text{list}
\end{bmatrix}
\end{bmatrix}
$$