On Double-Headedness and the Anatomy of the Clause*

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ABSTRACT: We argue that the Minimalist view of phrase structure in Chomsky 1995 should be minimally extended to allow for phrases that have more than one head, so long as the two heads have the same category features and are not attracted by a higher head. This innovation results in an elegant typology of the various kinds of syntactically distinguishable serial verb constructions (SVCs) found in Edo and related West African languages, as discovered by Stewart (1998). In particular, we claim that the different SVCs come from different choices of which phrase in the clausal structure is doubly headed: Voice, light v, or V. Moreover, details of Edo syntax allow us to make some refinements to the theory of clause structure; these include showing that Kratzer's Voice head is distinct from Chomsky's v head, and showing exactly where agents, themes and goal phrases are generated. Empirical evidence for our claims comes from a variety of syntactic and semantic sources, but especially from the position and interpretation of various classes of adverbs.

1. Introduction

What are the basic syntactic building blocks of the clause, and how can they be arranged? These questions are as interesting to linguists as questions about the basic building blocks of matter have been to physicists. They are also nearly as difficult. Just as protons and quarks are hard to isolate because they nearly always combine with other elements into complex wholes, so it is for the building blocks of the clause. A decompositional mood prevails within the Principles and Parameters tradition, which now posits relatively many small building blocks. The most obvious support for this view would be to find languages in which every syntactic head that theoreticians

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The Edo judgments reported in this paper are those of the second author, as corrected and clarified in many discussions with his friends and relatives, especially Iyesogie Stewart-Orumwense, Omoregie Inneh, and Tesmos Woghiren. We thank these other members of the Edo diaspora in North America for their support, patience and help, but do not hold them responsible for any remaining errors.

The Edo examples are written using the standard Edo orthography (see Agheyisi 1986 for description), except that we have added markings of high tone (´), low tone (à), and downstep (!). We have not indicated all of the complex tonal phenomena that happen in phrasal constructions under normal elision, however, and our transcriptions should not be considered fully reliable, especially for phonological purposes.

We have been working on this research for longer than we care to admit, and we have almost surely forgotten some of those who have contributed to it. However, we do not neglect to thank those we remember: especially our colleagues at McGill University and Rutgers University, and very lively and perceptive audiences at Cornell University, Indiana University, University of Massachusetts-Amherst, Rutgers University, the University of Maryland, CUNY Graduate Center, and the University of Pennsylvania. We thank in particular Lisa Travis, Claire Lefebvre, Maria Bittner, Paul Pietroski, Nigel Duffield, Hubert Truckenbrodt, Chris Collins, and Marcel den Dikken for detailed input on various points. Again, none of these people is responsible for the remaining inadequacies.

put forward corresponds to a discrete word that appears in the proper hierarchical position. However, such languages turn out to be extremely rare or nonexistent (Cinque 1999). It seems that free Voice heads (for example) are nearly as unstable as free quarks; they immediately become null, incorporate into, or conflate with other elements. So proponents of the decompositionalist view need to be clever to find less direct evidence, either by collating the partial records of many languages (e.g. (Cinque 1999) and others), by finding ways of reconstructing syntactic structure from morphological structure (e.g., (Baker 1988) and others), or by looking carefully at the results of switching roots from verbal contexts to nominal ones and back (e.g., Marantz (1997), Travis to appear, and others). But the clever can always use some help.

In this article, we would like to propose another way of uncovering the basic structure of the clause, and explore some of the results of using it. The approach involves studying serialization phenomena, in particular the Serial Verb Constructions (SVCs) found in certain West African languages (among others). A canonical example of an SVC from the Nigerian language Edo is:

(1) Òzó ghá dè ìyán rè.
Ozo FUT buy yam eat
'Ozo will buy yams and eat them.'

A common descriptive characterization of SVCs is that they are clauses that have a single tense node, but two or more verbs, with no overt markers of coordination or subordination.[1] This description is rather transparently true of (1). Note, however, that it crucially depends on the view that T and V are different elements in the structure of the clause: if they were not distinct elements, then there could not be different numbers of them. This background assumption is not now controversial, but it was back in the history of generative grammar because of the way that tense and the verb often fuse into a single word. However, if Noam Chomsky had been Nigerian, SVCs like (1) might have been the key to this discovery rather than patterns of auxiliary verbs in English.

West African languages can still make their contribution, however, by way of an extension of this form of reasoning. Recent work on SVCs—especially (Stewart 1998)—has shown clearly that there are several syntactically distinguishable kinds of Serial Verb Construction, which the simple descriptive generalization above does not have a rich enough vocabulary to talk about. We argue that this is confirmation of the current view that there are more "joints" in the skeleton of the clause than just the Infl-Verb joint of the GB-era. In particular, suppose that Edo and similar languages have (2) as a consequence of their parameter settings.

(2) For each head F in the verbal extended projection, if F selects G, then
$[_{FP}$ F $[_{GP}$ G1 … G2 …]] is also possible.

Then the different types of SVCs will be the result of taking advantage of the serializing option in (2) at different joints in the skeleton of the clause. Moreover, we have good evidence that the

[1](Schachter 1974) is an early and particularly clear expression of this intuition in generative terms; Baker 1989 is a more recent version, with some technological developments to handle object sharing. See (Sebba 1987) and Stewart 1998:ch.1 for brief histories of SVC research and overviews of how the topic has been delimited in the past.

clausal anatomy we are using is right if it together with (2) (plus principles needed independently) induce the right typology of SVCs.

The big picture will look like this. (Stewart 1998) argues that there are three syntactically distinct kinds of serialization in Edo; (3) gives paradigmatic examples of each kind, together with Stewart's name for the construction:

(3) a. Òzó ghá gbè èwé khiẹ̀n ùhùnmwùn érẹ̀n. COVERT COORDINATION (CC)
Ozo FUT hit goat sell head its
'Ozo will kill the goat and sell its head.'

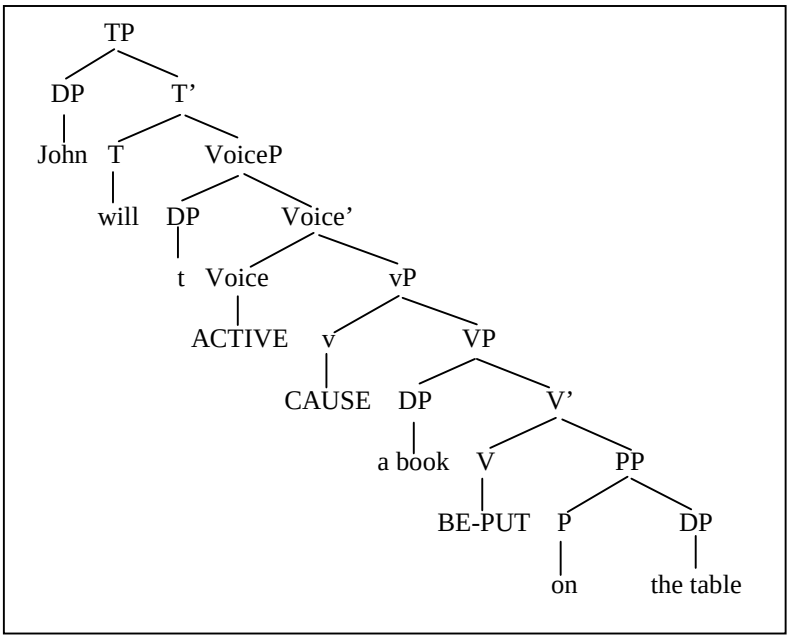
b. Òzó ghá gbè èwé khiẹ̀n. CONSEQUENTIAL SVC (CSVC)
Ozo FUT hit goat sell
'Ozo will kill the goat and sell it.'

c. Òzó ghá gbè èwé wù. RESULTATIVE SVC (RSVC)
Ozo FUT hit goat die
'Ozo will strike the goat dead.'

The most obvious distinguishing characteristics of these constructions concern the transitivity of the second verb: the Covert Coordination contains two transitive verbs, each with an overt object;[2] the consequential SVC contains two transitive verbs but only one overt object, and the resultative SVC contains a transitive first verb and an unaccusative second verb. Several more subtle properties that distinguish various constructions will be investigated as we go. However, West African languages such as Edo, Yoruba, Akan, and Ewe typically have all three of these constructions, giving credence to the view that they are licensed by one, rather general parameter, as in (2). The clausal anatomy that we claim produces these types is:

[2] These are actually subsets of broader generalizations. More accurately, CCs can also combine a transitive and intransitive verb, although in a very different way from RSVCs. Also RSVCs can combine two unaccusative verbs (see section 5.3) . Unergative verbs, it seems, can be found only in CCs: see sections 5.1 and 6.2 for discussion.

(4)



Specifically, we claim that CCs are the result have having two VoicePs under a single TP; CSVCs have two vPs under a single VoiceP, and RSVCs have two VPs under a single vP. These then are the main joints in the clausal skeleton.

Not all aspects of this skeleton are equally accepted. Of these, the distinction between T and V is most familiar. The distinction between v and V is generally accepted within Principles and Parameters, but has not much influence outside that tradition. More radical is the claim that Voice and v both exist and need to be distinguished; these have typically been taken to be two different labels for essentially the same category, although there are hints in the previous literature that both might be needed. Similarly, what we say about the location of the agent is quite standard (among those that adopt this kind of framework); the position of the theme is also reasonably standard but in need of good empirical support. Finally, what we will say about the position of goals and other indirect objects is rather controversial. However, in all these matters we hope that readers will be pleased to see new support for things they already believe, and then feel stretched when they see similar arguments for things that they do not necessarily believe.

Our discussion begins with a brief investigation into the theoretical underpinnings of the informal serialization parameter in (2). Following that, we proceed from the top of the clausal skeleton downward. We begin with the CC because it is perhaps the least strange of the three constructions, and therefore makes a comfortable starting point. Then we introduce the CSVC, contrasting it with the CC, and then the RSVC, contrasting it with both CCs and CSVCs. Finally, we take up the questions of where the theme and the goal must be in turn.

2. On Double Headed Projections

Before going into a detailed study of the various kinds of SVCs and how our view of clausal architecture can illuminate them, it is worth taking stock of what is required to make the kind of double-headedness implied by (2) possible from a theoretical perspective. A certain kind of

double-headedness was proposed for SVCs back in Baker (1989), but that view has not in practice been widely adopted. Indeed, some leading theoreticians—most notably Kayne (1995)—have expended significant effort to explain why a phrase can never have two heads, foreclosing on this kind of analysis. Thus, it is worth assessing from the beginning just what is the conceptual price tag associated with allowing doubly-headed phrases into the range of analytic possibilities.

In fact, the price tag seems to be quite small, particularly given the theory of phrase structure outlined in (Chomsky 1995). A basic tenet of Chomsky's Minimalist approach is that the general operation Merge can in principle combine any two syntactic objects to form a new syntactic object. Therefore, combining two verbal phrases is a possibility, a priori. Next, Chomsky proposes that the syntactic object that results from an application of Merge must receive a label, and that this label must be calculated in some simple way from the labels of the two constituent parts. Ultimately, the label must be a set of features associated with the lexical entry of one or more words that the syntactic object is built from, given the assumption that the computational system never introduces new material into the representation (the Inclusiveness Condition). More specifically, Chomsky 1995:244 lays out three choices of where the label of a new phrase formed by Merge could come from. Let X be the set of features that is the label of the first phrase, and Y be the set of features that is the label of the second phrase. Then the label Z of the merged phrase could be X, Y, the union of X and Y, or the intersection of X and Y. The first two options lead to the familiar kind of headed structures that are the standard stock and trade of syntactic analysis. The last two possibilities—union of features and intersection of features—Chomsky dismisses very quickly on the grounds that neither set-theoretic process will in general give a phrase the label of which will allow it to undergo further computation. Whenever Merge puts together two phrases with significantly different feature values, Union creates a phrase with conflicting feature values, while Intersection creates a phrase with few or no features. Either way, the phrase will not be able to participate in further computation; for example, it probably cannot be selected by other heads to create a complete syntactic structure. Now if this is true, then within the logic of the Minimalist Program we do not want to explicitly ban labeling a phrase by way of Union or Intersection of feature sets, since that can be left to general principles. However, there is one important special case where Chomsky's reasoning does not apply: namely the case in which the features in the labels of the two phrases combined by Merge are identical, or nearly so. In that case, the intersection will be no less than the features of one of the subparts, and the union will be no more than that; either would give a coherent label for the new category that could support further computation. Thus, doubly-headed phrases emerge as a natural possibility in the Minimalist Program when (and only when) the two phrases combined by Merge are identical or nearly identical in syntactic features. Indeed, it would require an extrinsic stipulation to exclude this possibility.

We can illustrate the workings of this theoretical opportunity with a simple pretend example, that ignores for the time being the decomposition of verbs into smaller categories. Consider the Edo SVC in (5) (this happens to be a CSVC):

(5) Òzó ghá dẹ̀ èmà kpèé (*pro*).
Ozo FUT buy drum play (it)
'Ozo will buy a drum and play it.'

First Merge creates one VP from 'buy' and 'drum'. The features of these two elements are very different, so one set must be picked over the other, in this case, the features of the verb. Suppose for the sake of discussion that these features are something like {+V, -N, +telic, +Acc. Case, /dE/}. Merge also creates a second VP from 'play' and the null object *pro*, labeling it with the features of 'play', perhaps something like {+V, -N, -telic, +Acc. Case, /kpee/}. Now the crucial step: Merge combines these two syntactic objects, and labels the result with the intersection of the features of the labels of the parts.[3] In this case, the label will be {+V, -N, +Acc. Case}. The phonological features of the two terms do not survive—if indeed these are part of the syntactic computation at all. Perhaps also aspect features do not survive, since the two verbs in this example happen to conflict in their lexical aspect ('buy drum' is typically an accomplishment; 'play drum' is an activity). However, the major category features do survive, and this is enough to support further computation. Suppose, for example, that the tense particle *gha* can only Merge with a syntactic object that is +V, -N (i.e., with a VP). This condition will be satisfied in (5) just as well as it is in a more ordinary sentence. This is only a toy example in at least two respects: it oversimplifies the internal structure of the verb phrase, and there is no serious proposal for exactly what features are associated with the verbs in the lexicon. However, it should serve to illustrate how easily double-headedness can come about in a Bare Phrase Structure system.

Next, we need to face the opposite theoretical problem: why does the existence of these double-headed structures seem to vary parametrically? More specifically, if Merge allows categories to be labeled by intersection, how is it that languages like Edo, Yoruba, and Ewe take advantage of this option, giving SVCs, whereas languages like English and French do not. To account for this, we briefly outline some ideas that are explored more fully in Baker and Stewart (1998) (see also Stewart 1998 for an early version). Many people have observed that the serializing languages of West Africa seem special in that they have little or no inflectional verb morphology. Moreover, among the Nigerian languages there seems to be a negative correlation between the presence of inflectional verb morphology and the possibility of SVCs: thus, Igbo has much more verbal inflection than Yoruba or Edo, and it has fewer kinds of SVCs, at least on the surface (Déchaine 1993).[4] This observation suggests the following account. In languages where verbs are inflected for tense, the verb must move to T at some point in order for a checking relationship to be established. For Chomsky 1995, this movement is the result of the T attracting the closest head that could check its features. Suppose, however, that the VP that was in construction with T were doubly-headed. It is reasonable to suppose that T cannot find a unique head to attract in this situation. One simple formulation of Attract that has this consequence is:[5]

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[3] This view can be contrasted with Dechaine 1993:ch. 4, who also holds that two VPs can be merged to form a larger VP in serializing languages, but who assumes that one of the verbs must be chosen as the head of the construction as a whole. In her view, some types of SVCs are headed by the first verb, and some are headed by the second. Some of the asymmetries between the two verbs in SVCs that she has in mind we attribute to non-syntactic interpretive factors at the Conceptual-Intentional interface; see section 8 for some discussion.

[4] Serial verb constructions also seem to be found in the Caribbean Creoles, and in certain languages of South East Asia such as Thai, Khmer and Vietnamese. These language families are also known to have essentially no inflectional morphology on verbs. While this is encouraging, we do not know that putative SVCs in South Asian languages and West African languages have been compared in enough syntactic detail to be certain that they are truly the same phenomenon.

[5] See Baker and Stewart 1998 for a refinement and some caveats.

(6) X attracts a head Y iff Y can check a feature of X, and for all Z such that Z is not equal to Y and Z can check this feature of X, Y asymmetrically c-commands Z.

In that case, attraction would fail, and the structure would crash because the relevant features of T are left unchecked. On the other hand, suppose that in some languages with no inflectional morphology on the verb, it can be the case that there are no features that need to be checked between T and V at any level. Attraction is not relevant in such a language, and the formation of doubly-headed VPs will not run into any problems. In such languages, SVCs will be possible. The various possibilities are summarized in (7).

(7) French, Igbo: T has a strong V feature (it attracts V in syntax) --no SVCs
English: T has a weak V feature (it attracts V at LF) --no SVCs
Edo, Yoruba, Vietnamese[6]: (most) Ts have no V feature. --SVCs are possible.

There is some particularly striking evidence internal to Edo that confirms this approach. Most languages seem to be quite uniform with respect to Verb-attraction-to-Infl. Thus, verbs move overtly to Infl in all tenses in French (and Igbo), and do not move overtly in any tense in English (or Yoruba). However, Edo does have one tense that shows up as an inflectional suffix on the verb: namely, the past perfective. This is expressed in Edo by /r/ plus a harmonizing vowel, so we call it the RV suffix. That verb movement to Infl takes place overtly in this tense (only) can be seen in the fact that past perfective verbs show up before VP-initial adverbs like *gi<u>e</u>gi<u>e</u>* 'quickly', whereas all other verbs come after such adverbs:

(8) a. Àm<u>è</u> <u>ò</u>ré Òzó gi<u>é</u>!gi<u>é</u> tué yè íkóróbá.
water FOC Ozo quickly pour into bucket
'It's water that Ozo quickly poured into the bucket.'

b. Àm<u>è</u> <u>ò</u>ré Òzó tùé-rè gi<u>é</u>!gi<u>é</u> t_V yè íkóróbá.
water FOC Ozo pour-RV quickly into bucket
'It's water that Ozo has quickly poured into the bucket.'

(When transitive verbs appear in this tense, the direct object must be clefted, for Case-theoretic reasons; see Baker and Stewart 1998 for analysis.) Thus, in this one tense, Edo patterns with French. Strikingly, it is also impossible for SVCs of any kind to appear in this particular tense; (9) shows one example (see Baker and Stewart 1998 and Stewart 1998 for others).

(9) Èvbàré <u>ò</u>ré Òzó lé-(*rè) khi<u>é</u>n(-*r<u>è</u>n). CSVC
food FOC Ozo cook-RV sell(-RV)
'It's food that Ozo has truly cooked and sold.'

[6] This mention of Vietnamese is based on (Duffield 1998) and personal communication. However, Duffield's paper only considers the resultative kind of SVC, and these also allow an alternative word order in which the second verb precedes the shared object in Vietnamese. See also Schiller 1989 for a range of SVCs in Thai and Khmer, together with Schiller's (1988) claim that these languages have no Infl node in the English sense.

This confirms the idea that the possibility of having doubly-headed structures is dependent on there being a particular kind of relationship (or non-relationship!) between the doubly-headed category and the functional category that dominates it.[7]

The obvious next question is whether double-headedness can arise in categories other than VP. (Baker 1989) has been criticized on the assumption that this never happens. We are not so sure. For example, Lefebvre (1989) has argued that serialized prepositions are found in Fongbe—although the clinching evidence for this is perhaps lacking. Another possible case is raised by Noyer (1998), who argues that certain noun-noun"compounds" with conjunctive (dvandva) meanings in Vietnamese are really phrasal constructions, because the two parts can be separated from each other by verbs and other syntactic elements. Indeed, many languages that are said to have productive dvandva compounding would be worth re-examining with the possibility of double-headedness in mind. A somewhat similar case much closer to home is complex proper nouns like *Noam Chomsky* in languages like English. It is tempting to say that these are doubly -headed, because either part can be used by itself to refer to the man in question (in the right social contexts), and because in languages like Latin both parts inflect for the same Case. Moreover, it is striking that proper nouns in English are relatively free from functional support: they do not normally appear with the determiners or number marking that is obligatory with common count nouns in English. Determiners and number heads may trigger raising of common nouns at LF in English (cf. (Longobardi 1994)); this would make double-headed common noun phrases impossible in English, for the same reason that SVCs are impossible. However, complex proper nouns might be possible precisely because they do not appear in DPs or number phrases in English, and therefore they do not need to be attracted by anything. We are not sure this is the right analysis of complex proper nouns; we only offer it as an intriguing possibility to stretch our readers' imaginations and undermine their certainty that double-headedness is a rare phenomenon. More generally, the question of whether double-headedness in nonverbal constructions is expected or found must wait until we have more crosslinguistic information about functional heads and their relationships with nonverbal lexical heads than we have now.

Finally, suppose that we take into consideration the fact that there are a variety of heads within the verbal system itself, as indicated in (4). What then are the possibilities for double-headedness among the various categories included in this structure? As usual, this depends on how certain auxiliary assumptions are developed. Of these, the most crucial is the question of which heads attract which in this richer structure. This is a question that deserves a more principled investigation than it usually receives, people being quick to say that T has a strong V-feature without asking why or precisely what feature system is being used. Suppose, however, that we assume that Attract is fundamentally a relationship between T and V, even in this more articulated structure, and that the intermediate categories of Voice and v are relatively inert to the dynamics of attraction. (Perhaps this is true because V is the fundamental predicate of events, and T is the ultimate binder of V's event variable (Higginbotham 1985).) If that is so, then the Edo system in which (most) Ts do not trigger V movement will single-handedly make possible at least three different kinds of double-headed structures: double-headed voicePs, double-headed vPs, and double-headed VPs. Each of these structures will be possible in Edo, whereas all of

[7] This proposal is similar in spirit but the opposite in detail from that of (Collins 1995). Both proposals assume that there is something special about T in SVC languages. However, Collins assumes that T in serializing languages can check features with multiple verbs (following unpublished work by Hiroyuki Ura), whereas we claim that T in serializing languages checks features with no verb.

them will crash in English and French, because they all have two verbs that are equally close to the single attracting Infl. Indeed, if we can demonstrate that there are in fact (at least) three different kinds of SVCs, it is still attractive to have them all be licensed by a single property. The reason is that, in spite of their differences, CCs, CSVCs, and RSVCs seem to co-occur in the same languages rather consistently: those languages that have one of these constructions typically have them all. This is true at least of the better-studied West African languages like Yoruba (Baker 1989), Ewe (Collins 1997)[8], Akan (Campbell 1996:116), and Edo (Stewart 1998). The generalization also holds for at least some Caribbean Creole langauges such as Sranan (Sebba 1987), and seems to be true for South-East Asian languages like Thai and Khmer, judging from the (somewhat fragmentary) range of examples in (Schiller 1989).[9]

Having shown that double-headedness fits quite easily into a more general conception of phrase structure, we turn now to the main empirical burden of the paper: showing that double-headedness can provide an insightful account of the different types of SVCs in a way that illuminates the basic anatomy of the clause. For ultimately the issue of double-headedness rests on the empirical question of whether double-headed structures can be shown to exist in natural languages.

3. Tense and Voice: the Covert Coordination.

Consider first the Covert Coordination construction, which we claim to consist of two or more VoicePs under a single TP. Descriptively, CCs are only slightly different from VP-conjunctions in English, at least on the surface. Some Ts are independent heads in Edo, including future *gha*, progressive *gha*, past habitual *gha!a*, past negative *ma*, and nonpast negative *i*, all of which are in complementary distribution with each other. A CC consists of one of these particles (at most), followed by two or more complete verb phrases with any internal structure:

(10) Òzó ghá/ghá!á/má/í gbé!-lé ẹ̀wé khiẹ́n!-né ùhùnmwùn íràn.
Ozo FUT/PIMPF/PNEG/NPNEG kill-PL goat sell-PL head their
'Ozo will/used to/didn't/won't kill goats and sell their heads.'

Both verbs are in the semantic scope of the Tense particle, so that its negative or modal or habitual force applies to them both. This scope also has a phonological reflex in Edo. Most of the Tense particles have high tone, which causes a tonal shift on the head verb of their complement. Disyllabic verbs in Edo generally have a Low-High tone pattern, but when they appear in the domain of a suitable T, the High tone of T spreads onto the first syllable of the verb, creating a High-downstep-High tone pattern on the verb. In CCs, both verbs show this special tone pattern, as seen in (10). This is what one would expect if there were two complete verbal phrases associated with a single T.

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[8] Although according to Collins' description, the Ewe equivalent of the Edo CC has multiple I-bars rather than multiple VoicePs; we do not investigate this apparent difference.

[9] In contrast, Haitian Creole seems not to have any of these kinds of SVC in a productive fashion, although it has several kinds of rather fixed serial-like constructions; see, for example, Déchaine 1993:245 on the absence of RSVCs in Haitian.

Potentially problematic for our view is Foley and Olsen's (1985:48) claim that there are some languages that have SVCs with intransitive verbs (RSVCs?) but not with transitive verbs (CSVCs?). However, they do not name any clear cases, and languages of this type remain to be investigated in detail.

The facts of CCs by themselves can tell us relatively little about the internal structure of the verbal phrases that are the complements of T. However, there is some evidence that these phrases both include base positions for the subject argument, in accordance with the Predicate-internal Subject Hypothesis. This evidence comes from a reflexive-like element *tobọ́re* 'by him/her/itself' (plural: *tobiran* 'by themselves'). This element has a rather complex distribution. In addition to a use in VP-final positions as an adverb and/or secondary predicate (which we put aside), *tobọ́re* can appear right-adjoined to a noun phrase in any syntactic position in the clause, including subject position:

(11) Òzó tòbọ́rè ghá gié!gié lé èvbàré.
Ozo by.self FUT quickly cook food.
'Ozo by himself will quickly cook the food.'

However, *tobọ́re* can also appear "floated" off of the subject NP, between the tense head and the verb, in roughly the same position as preverbal adverbs:

(12) Òzó ghá (gié!gié) tòbọ́rè lé èvbàré.
Ozo FUT quickly by.self cook food
'Ozo will quickly cook the food by himself.'

It can also appear between a control verb and its embedded infinitival complement, after the nonfinite T head *ya*:

(13) Òzó miànmián yá tòbọ́rè lé èvbàré.
Ozo forgot to by.self cook food
Ozo forgot to cook the food by himself.

In these respects, its distribution is very much like that of the floated quantifiers in French and English studied by Sportiche (1988). Sportiche argues that such floated elements are adjoined to the subject DP, as in (11), but in (13) the subject NP is a null PRO, controlled by the matrix subject, while in examples like (12) it is a subject generated inside the VP and raised to the Spec, TP position. Thus, this element can mark null subject positions.

With this in mind, consider possible positions of *tobọ́re* in CCs:

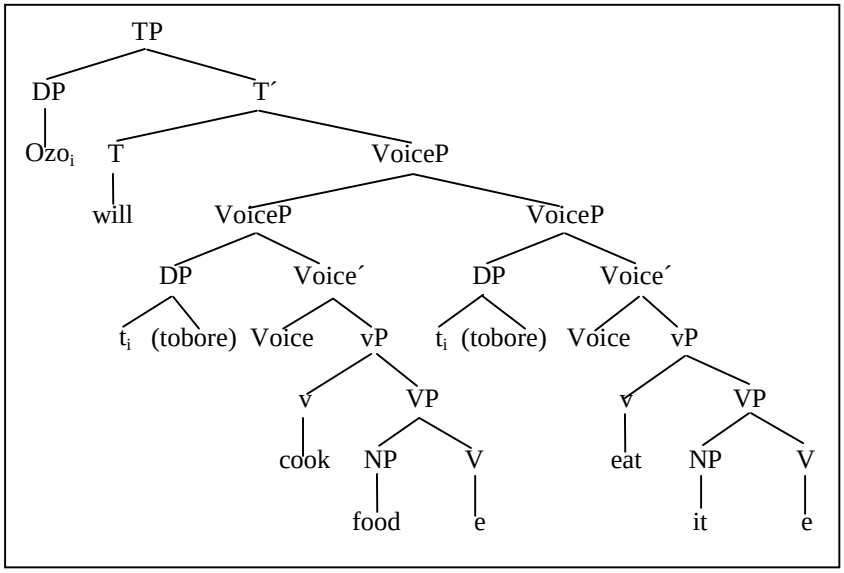
(14) a. Òzó ghá tòbọ́rè lé èvbàré rrí ọ́rè.
Ozo FUT by.self cook food eat it
'Ozo will cook the food by himself and eat it.'

b. Òzó lé ízẹ̀ tòbọ́rè rrì ọ́rè.
Ozo cook rice by.self ate it
'Ozo cooked rice and ate it by himself.'

These examples show that *tobọ́re* can appear before either verb, and is understood as saying something about that verb alone. If *tobọ́re* indeed marks DP positions, then there must be such a position in each of the verbal phrases. Thus, agent NPs are generated independently in both of the verbal phrases and they raise by Across the Board movement to the single subject position in the specifier of TP. Again, this is perfectly comparable to English VP-conjunction (*They will all*

buy a book and read it and *They will buy a book and all read it* are both possible). We do not yet have any detailed knowledge about exactly where these subjects are generated. If, however, we find reasons to adopt Kratzer's (1996) proposal that agentive subjects are generated in the specifier of a Voice Phrase, then there must be two of these Voice Phrases in a CC, in agreement with our hypothesis. The structure would then be something like (15), with the internal structure of the VoicePs anticipating later developments:[10]

(15) Covert Coordination:



It is natural to compare this CC structure with standard coordination structures. Such structures exist in Edo, and well as in English. The relevant conjunction is the particle *vbè*, which can come between essentially any two VPs. The syntactic and semantic differences between CCs (without *vbè*) and corresponding overt coordinations (with *vbè*) are very slight; adverb positioning and interpretation facts seem basically the same in both constructions, for example. There is, however, one rather sharp syntactic difference of some interest, involving A-bar extraction. Extraction from an overt coordination obeys the Coordinate Structure Constraint, in the sense that the object cannot come out of either of the two VPs. In contrast, extraction of either object is much better in a CC. Thus, there are minimal contrasts such as the following:

(16) a. Ìyán ò́ré Òzó dé̱ èmió!wó (*vbé) lé --.
yam FOC Ozo buy meat and cook

[10] The reader may wonder whether our methodology can tell us anything interesting about higher joints in the clause, revealing finer structure in the Infl space. We leave this issue largely open. Of the well-attested higher functional categories, negation is the other obvious one in the extended projection of the verb; however, in Edo tense and negation fuse into a single "portmanteau" head, at least on the surface. Various other particles can appear between the T node and the first verb, such as repetitive *gha*, *te* 'almost', *da* 'just', etc. However, we do not have any decisive evidence to tell whether these are adjoined elements (like adverbs) or functional heads of their own category. Moreover, if serialization is possible at these joints, the result is just slightly different kinds of CCs, which do not differ in important ways that involve the syntax of verbs and their arguments from the kind of CCs discussed here. Therefore, the study of serial verb constructions per se has little to add here, and we leave this to a finer-grained study of the Edo preverb space than we can undertake here. Instead, we concentrate on the lower part of clausal skeleton: the lexical and quasi-lexical categories that are involved in the licensing of DP arguments.

'It's yams that Ozo bought some meat and cooked.'

b. (?)Èmió!wó ò́ré Òzó dé -- (*vbé) lé ìyán.
meat FOC Ozo buy and cook yam
'It's meat that Ozo bought and cooked some yams.'

This shows that CCs are not just true coordinations in which the conjunction has been elided somehow; rather the presence or absence of the conjunction has syntactic significance (and so the term "covert coordination", inherited from Baker 1989, proves something of a misnomer). More specifically, we suggest that overt conjunctions are heads that project normal X-bar theoretic structures, as suggested in (Kayne 1995:11-12, 57-59). The first conjunct is syntactically the specifier of *vbe/and*; as such, extraction from that conjunct is ruled out by the Subject Condition (a subcase of the Condition on Extraction Domains). The second conjunct is syntactically the complement of the *vbe/and*. This too is opaque to extraction if one assumes that the conjunction is a functional category that does not theta-mark its complement (and hence does not L-mark it in the sense of (Chomsky 1986)). On this proposal, then, there is no Coordinate Structure Constraint distinct from the other, better-studied Island conditions. In contrast, CCs have no conjunction head, and therefore no specifier/complement structure is induced. Thus, extractions from the component verbal phrases are not ungrammatical for the same reasons as extractions from the parts of an overt coordination. In fact, these extractions violate no known principles, and are observed to be acceptable. This then is a clear distinction between double-headed structures and the superficially similar coordination structures: the double-headed ones allow extraction from either piece. (This is also true of CSVCs and RSVCs, as shown in later sections.)

4. Voice and v: the Consequential SVC

Next we turn to the Consequential SVCs, to see what they tell us about the structure of the clause in general, and the position of the agent in particular. Recall that these are structures that consist of two transitive verbs but where only the first verb is followed by an overt object. Another prototypical example of this is:

(17) Òzó ghá dè èmió!wó lè.
Ozo will buy meat cook
'Ozo will buy some meat and cook it.'

Like the CC, CSVCs clearly have only a single tense node, since only one tense particle can appear (**Òzó ghá dè èmió!wó ghá lè* 'Ozo will buy meat will cook (it)'). However, there is also reason to say that CSVCs (unlike CCs) have only a single Voice Phrase projection. The most obvious evidence for this comes from the distribution of *tobóre*.[11] We saw in (14) above that a floated *tobóre* can appear before either verb in a CC. In sharp contrast to this, a floated *tobóre* can appear in only one place in CSVCs: before the first verb. In more descriptively

[11] This distribution cannot be explained simply by saying that *tobóre* is a preverbal adverb, since other preverbal adverbs can appear between the two verbs of a CSVC (see (40) below).

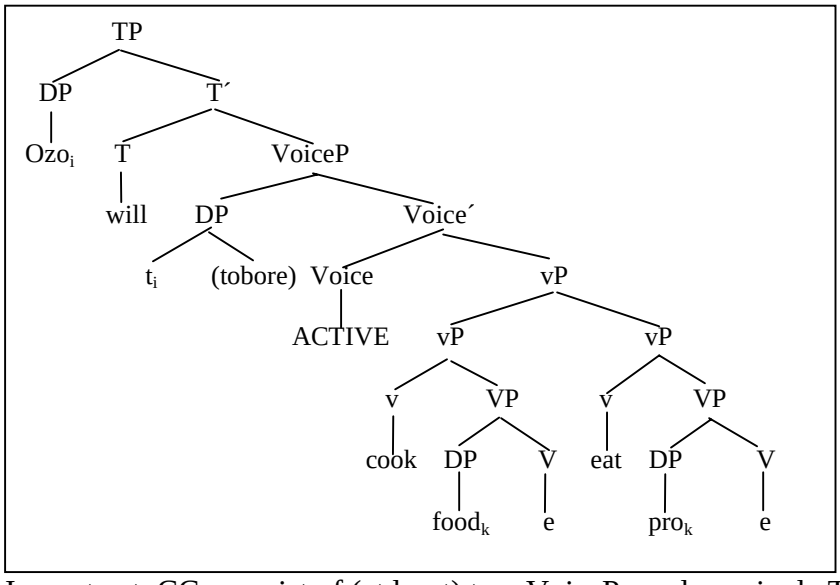
neutral terms, *tobore* can come immediately before the second verb if and only if that verb has an overt object:

(18) a. Òzó ghá tòbórè lé èvbàré ré.
Ozo FUT by.self cook food eat
'Ozo will by himself cook the food and eat it.'

b. *Òzó lé èvbàré tòbórè ré.
Ozo cooked food by.self ate
'Ozo cooked some food and by himself ate it.'

Moreover, in (18a) *tobore* is understood as having scope over both verbs: it means that Ozo will perform the entire cooking-plus-eating process voluntarily/alone, not just the cooking part. Continuing to assume that the presence of *tobore* can reveal silent subject positions, the data in (18) strongly suggest that there is only one base position for an agent in a CSVC, even though there are two distinct lexical verbs. This recalls Kratzer's (1996) proposal that agentive subjects are not generated in Spec, VP after all, but rather in the specifier of a Voice Phrase, where Voice is an (often abstract) functional head that more or less immediately dominates the verbal phrase. Thus, we adopt Kratzer's proposal, and further claim that the transition from Voice to VP is the "joint" where CSVCs are formed; CSVCs consist of a single VoiceP head that dominates two Verbal phrases. This gives us a structure like (19), where again the details of the internal structure of the sister of the Voice head anticipates later developments.

(19) Consequential SVC:



In contrast, CCs consist of (at least) two VoicePs under a single T, as above.

This proposal also helps to explicate certain semantic judgments that Edo speakers have about CSVCs that contrast with judgments on both VP conjunction in English and CCs in Edo. Kratzer 1996 claims that the semantic function of the active Voice head is to assert that the DP in its specifier is the agent of the event described by its VP complement. In CCs and English VP conjunctions, there are two Voice heads, one for each verbal phrase, with distinct NPs generated

in their specifiers—although this is somewhat masked by the fact that the two agent phrases raise in Across-the-Board fashion to Spec, TP. Then the meaning of the CC should be something like (20), where x stands for whatever the subject in Spec, TP denotes.

(20) Exists_e (buy(e) & Agent(e, x) & ...) and Exists_f (read(f) & Agent(f, x) & ...)

On the other hand, CSVCs consist of a single active Voice head that takes a double-headed verbal phrase as its complement. Without going into technical details, it is natural to interpret the double-headed VP as describing a composite event that is made up of the two subevents characterized by the two lexical verbs (see section 6.2 for some further discussion). Then by normal principles of compositionality, the Active voice adds the information that the subject is the agent of this composite event, rather than being the direct agent of the constituent events. This would correspond to a formula such as the one in (21).

(21) Exists_e (Agent(e, x) & $\text{Exists}_{f,g}$ (e=COMBINE(f,g) & buy(f) & read(g) &...))

Presumably these two representations come to much the same thing; it should follow from the proper characterization of "agent" that one cannot be the agent of a large scale event without being the agent of the constituent events (see Pietroski 1998 for a characterization that has approximately the right properties). However, it is plausible to think that (21) makes a somewhat stronger claim than (20) does: that not only does Ozo both buy and read, but he does so in a single dose of agency. This seems warranted. So imagine a situation in which Ozo buys a book intending to give it to someone else as a gift. However, when he gets home he becomes fascinated by the description on the back cover, and in a moment of weakness tears off the plastic wrapper and begins reading the book. The formula in (20) is true in this situation, and this matches the fact that a CC like (22) is judged to be true in this situation, as is the English sentence "Ozo bought a book and read it".

(22) Òzó dé né!né èbé tié ègbà nó!kárò.
Ozo buy the book read act that.is.first
'Ozo bought the book (of plays) and read the first act.'

However, the corresponding CSVC is judged to be false in this situation:

(23) Òzó dé né!né èbé tié.
Ozo buy the book read
'Ozo bought the book and read it.'

(23) would only be used in situations in which Ozo buys the book with the intention of reading it himself, and then carries out that intention.[12] In other words, both the buying and the reading must be part of a single coherent plan on the part of Ozo. This fits very well with the representation in (21), where Ozo is the agent of a composite event, not merely the agent of two atomic events (see Stewart 1998:77-80 for more examples).

[12]This partly explains why CSVCs are sometimes glossed as purposive constructions in the literature, rather than as coordinate ones. However unlike true purposives they assert that the intended event did take place. (See Campbell 1996 for a description of similar facts in Akan.)

There is a third, more indirect way of seeing the difference between CCs and CSVCs in Edo; this involves the syntax and semantics of certain preverbal adverbs, such as *giegie* 'quickly' and *gele* 'truly'. Stewart 1998 refers to these elements as I-type adverbs, because they appear somewhere in the Infl space of the clause. More specifically, (24)a shows that in sentences with no serialization the adverb can appear after the tense particle but before the floated element *tobore* that marks the trace of the subject in Spec, VoiceP. This indicates that the I-type adverbs can left-adjoin to VoiceP. However, (24)b shows that the I-type adverb cannot come before the tense particle; thus, it cannot adjoin to T´ (or TP, since it is also bad in front of the subject *Òzó*).

(24) a. Òzó ghá giegie (tobore) dunmwun ìyán.
Ozo FUT quickly (by.self) pound yams
'Ozo will quickly pound yams (by himself).'

b. *Òzó gìégìé ghá dunmwun ìyán.
Ozo quickly will pound yams.
'Ozo quickly will pound yams.'

So (25) holds as a descriptive generalization about adverb placement; presumably this is related in some fashion to the inherent meanings of this kind of adverb, but we will not investigate this here.

(25) I-type adverb placement (preliminary).
I-type adverbs in Edo can left-adjoin to VoiceP, but not to TP.

Now given this, our theory predicts that CCs and CSVCs will differ with respect to the possibilities of I-type adverb placement. In CCs, each verb is contained in its own VoiceP, to which an I-type adverb can adjoin. Therefore, it should be possible for an adverb to appear before either verb, having scope over only that verbal phrase. This is correct. Thus in (26)a, the planting event is said to be quick, but no claim is made about the relative duration of the second event. Therefore, an adverb of the same semantic type can appear before the second verb without being contradictory or redundant ((26)b).

(26) a. Òzó gié!gié gbó!ó ívìn bòló ókà
Ozo quickly plant coconut peel corn
'Ozo quickly planted the coconut and [he] peeled the corn.'

b. Òzó gié!gié gbó!ó ívìn gié!gié bó!ló ókà.
Ozo quickly plant coconut quickly peel corn
'Ozo quickly planted the coconut and [he] quickly peeled the corn.'

In contrast, an I-type adverb that comes before a CSVC (with no overt object of the second verb) is interpreted as modifying both verbs together. For example, (27)a means that the whole process of pounding-plus-selling the yams was quick (compared to other pounding-plus-sellings). It says nothing about how long the individual pounding and selling phases take, compared to each other or to simple poundings and simple sellings. Since the second VP is already in the scope of the I-type adverb in the CSVC, it is unacceptably redundant to repeat the same adverb before the second verb, as shown in (27)b, which contrasts with (26)b.[13]

(27) a. Òzó gié!gié dún!mwún èmà khién!-né
Ozo quickly pound yam sell-PL
'Ozo quickly pounded the yams and sold them.'

b. *Òzó gié!gié dún!mwún èmà gié!gié khié!n-né
Ozo quickly pound yam quickly sell-PL
'Ozo quickly pounded the yams and sold them.'

This difference in the scope of initial adverbs also has a morphophonological reflex in Edo. Disyllabic past tense verbs generally show a Low-High tone pattern. However, when an I-type adverb precedes such a verb, a floating high tone spreads onto the verb, giving it a high-downstep-high tone pattern, as shown in (28).

(28) Òzó dùnmwún ìyán vs. Òzó gié!gié dún!mwún ìyán.
Ozo pound yam Ozo quickly pound yam
'Ozo pounded a yam.' 'Ozo quickly pounded a yam.'

Now, when an I-type adverb precedes a CSVC, as in (27)a, both verbs in the construction show up with a H!H tone pattern; in contrast, only the first verb of a CC shifts to H!H in similar circumstances, as shown in (26)a. The generalization is that the tones of a verb are affected by an adverb if and only if the verb is in the scope of the adverb. Again, CSVCs and CCs are minimally different in this respect.

Our theory of the structural difference between CSVCs and CCs explains these judgments nicely. CSVCs have a single Voice Phrase, with two verbal phrases under it. Since I-type adverbs adjoin to Voice Phrases, they can target this single projection, and thereby have both verbs within their scope. On the other hand, the two verbs of the CC each occur in distinct Voice Phrases. An I-type adverb can adjoin to either of these Voice Phrases independently, and it will have scope only over the verbal phrase contained in the Voice Phrase that it adjoins to. Thus, the main effects of I-type adverb placement and interpretation follow immediately from

[13] This syntactic structure is not syntactically impossible; an I-type adverb can come before the second verbal phrase in a CSVC as long as it is neither entailed by nor contradictory with an I-type adverb at the front of the CSVC as a whole. See section 5.2 for discussion.

our independently motivated structure together with a simple generalization about where adverbs attach.[14]

5. v and V: the resultative SVC

The CSVC helps show that there is a distinct Voice Phrase structure within the verbal phrase, but it does not by itself tell us much about the internal structure of the rest of the verbal phrase. To get more information about this, we now bring the Resultative SVCs (RSVCs) into consideration.

5.1 Basic Issues

The most salient distinction between RSVCs and CSVCs is that RSVCs have only one transitive verb (the first one), whereas CSVCs have two. The following are some typical examples:

(29) a. Òzó suá Úyì dé.
Ozo push Uyi fall.
'Ozo pushed Uyi, causing him to fall.'

b. Ékítà khú áhiánmwè̲n làdián.
dog chase bird exit
'The dog chased a bird away (causing it to leave).'

Moreover, the intransitive second verb of the RSVC must of the unaccusative class, rather than the unergative class (see Baker 1989:429-532 for the first explicit discussion of this fact; it has since been replicated by others: see Campbell 1996 on Akan, Collins 1997 on Ewe, Lefebvre in progress on Fongbe):

(30) a. * Òzó suá Úyì só.
Ozo push Uyi shout
'Ozo pushed Uyi, causing him to shout.'

b. * Ékítà khú áhiánmwè̲n tín.
Dog chase bird fly
'The dog chased a bird, causing it to fly.'

Why should this sharp contrast exist? Simple-minded (i.e. structurally oblivious) semantic considerations do not seem to make the distinction. The examples in (29) have a causative flavor; they can be glossed as "Ozo caused Uyi to fall by pushing him" or "The dog caused the bird to leave by chasing it." However, it is every bit as reasonable to think that Ozo's push could

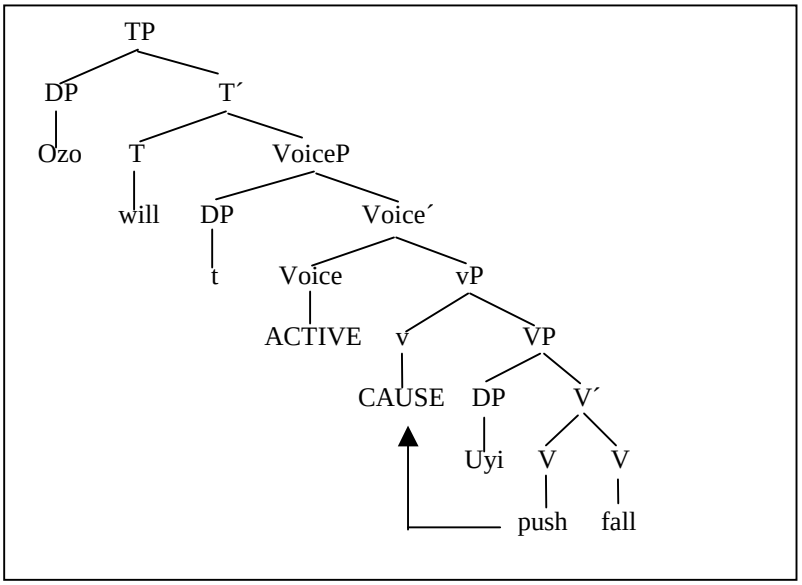
[14] On our account as it stands it should be possible to adjoin an I-type adverb to the larger Voice Phrase formed by Merging the two basic Voice Phrases in a CC, with the result that both verbal phrases of the CC are under the scope of a single I-type adverb. Such an interpretation is difficult or impossible to get in practice. Perhaps this is impossible for purely semantic reasons. Suppose that adverbs of this class are semantically predicates of events, as in the neo-Davidsonian theory of Parsons (Parsons 1990). Now CCs differ from CSVCs in that the two events characterized by the verbs in a CC are not interpreted as forming a single complex event semantically. Therefore, there is nothing suitable for an adverb attached to the biggest VoiceP to be understood as a predicate of.

cause Uyi to shout, and that the dog's pursuit could cause the bird to fly. Nevertheless, examples such as those in (30) are impossible.

Suppose that we think of this contrast in structural terms. A common-place assumption in the literature on lexical semantics and its relationship to syntax is that ordinary transitive verbs decompose into two elements. Adopting a version of some ideas of Hale and Keyser (1993), Chomsky 1995 refers to one of these elements as v and the other as V. Roughly, V characterizes the transition or result part of the event, whereas v expresses the causal dynamics and perhaps the process whereby the result/transition is achieved.[15] Syntactically, the projection of V is the complement of v. Unergatives have a similar structure, consisting of a v part and a V part; the only difference is that the projection of V either does not contain an NP object or that object is a fixed, cognate object determined by the verb. In contrast, unaccusative verbs are syntactically simpler than either of the other two types; they express states and simple transitions, and therefore contain only a substantive V element, not a causative v.

If this widely-held view of clause structure is correct, then we predict that the joint between v and V should be another possible locus of serialization. More specifically, we expect a structure consisting of one T, one Voice, one v, but two VPs within the domain of the v. The result would be:

(31) Resultative Serial Verb Construction:



Now this structure contains one v and two Vs. This is enough raw material to make one transitive verb and one unaccusative verb, but not enough to make two transitive verbs or a transitive verb and an unergative verb. Either of these last two combinations would require

[15] This view applies most comfortably to transitive verbs of the accomplishment class, which have two discernable components of meaning in virtually all lexical semantic studies. Achievement verbs can be looked at as accomplishments of very short duration, whereas many activities can be derived from accomplishments by modal and aspectual operators. However, whether the same decompositional structure should be attributed to all transitive verbs—especially stative ones—is controversial. This issue is not particularly crucial for our purposes because, in point of fact, noncanonical transitive verbs (particularly stative ones) cannot appear in either CSVCs or RSVCs in Edo. We leave open whether this follows from the fact that such verbs do not have the same syntactic structure, or whether it is due to other, more semantic factors.

having two distinct v nodes. Thus (31) is a promising structure for RSVCs. In contrast, CSVCs can be taken to have a single Voice node but two vs; each v can then combine with its own V to produce two fully transitive verbs. This structure was already anticipated in (19).[16]

There is an interesting tension between the analysis of RSVCs sketched in (31) and the restrictions on serialization sketched out in section 2. In section 2, we showed that a certain tense in Edo is incompatible with SVCs because it attracts a verb: in double-headed structures it does not know which verb to attract, and this results in a crash. The structure in (31) seems to present the same kind of problem: there is one v and two mutually c-commanding Vs that could move there. However, if our proposal is correct, this structure does not crash: rather the first of the two Vs moves by itself to v, thereby showing up before the object, but leaving the second V behind. This looks like a contradiction internal to our system. However, the contradiction disappears if we adopt the following:

(32) The v head does not attract V.

In other words, V-to-v movement is triggered by a different factor than verb-to-tense movement is. The condition on picking out the unique closest head is part of the inner workings of Attract; hence it is not relevant to V-to-v movement if (32) holds. The result is admittedly a less unified theory than one might wish for. However, there is ample reason to doubt that v-to-V movement and verb-to-T movement are really the same phenomenon even apart from SVCs. A historical precedent is Larson's original (1988) discussion of head movement within VP shells: he claimed that movement was triggered by the need for the verb to get to the right position to assign Case and theta roles, not by the kinds of morphological considerations (such as the Stray Affix Filter of (Baker 1988)) that have evolved into Chomsky's formulation of Attract. Behind this intuition is the basic fact that tense and the verb are often expressed by different morphemes within a complex word, whereas v and V are typically expressed by a single morpheme. Lastly and most importantly, it is well-known that whether verb-to-T movement happens overtly or not is subject to crosslinguistic variation: it takes place in French but not with main verbs in English, for example. In contrast, V-to-v movement does not show the same kind of parametric variation: it seems to be obligatory, with the result that the verb comes before the object in all otherwise head-initial languages. This is a strong indication that V-to-v movement is governed by different principles. All this being said, we leave open exactly what does cause V-to-v movement. Updated versions of Larson's original proposals are possible; an intriguing alternative would be to adopt a version of Truckenbrodt's (1999) idea that movement within VP shells is triggered by

[16] The hyper-attentive may be bothered by a difference in detail between (31) and (15): in the CC structure, the two voicePs are merged after taking specifiers, whereas in (31) the V projections are combined prior to taking a specifier. This would be a peculiar difference to have to stipulate. Fortunately, we think it can be derived from general principles. From a bare phrase structure perspective, there is no principled difference between X-bars and XPs, and Merge can in principle apply to any two syntactic objects. Thus, both types of construction should in principle be possible with either one specifier or two. However, principles of NP licensing can intervene to break the symmetry. In RSVCs, there is a single source of accusative Case in the one v; similarly, CCs have a single source of nominative Case in the one T head. However, there is a difference: subject NPs move to spec, TP to get/check Case in Edo, whereas objects stay in situ (see Baker and Stewart 1998). Therefore, in CCs two specifiers of VoiceP can be generated and raise in Across the Board fashion to Spec, TP. However, Across the Board movement is not possible for objects as a way of licensing two positions with one Case, because objects do not move for Case. Thus, two subject positions may be generated in CCs, but only one object position is possible in RSVCs. (These questions do not arise for CSVCs, because the double-headed category vP does not have anything generated in its specifier. Therefore, the two possibilities do not arise.)

a Head Peripherality condition, which says that a verbal phrase must begin with a lexical verb in head initial languages. With this tentatively in mind, we take the obligatoriness of V-to-v movement for granted in the rest of this article.

The structure in (31) has two V heads joining together to make a double-headed VP. However, from a Bare Phrase Structure perspective, this should not be crucial, since there is no difference in features between a head and a phrase. Thus, we would expect that one of the Vs might be able to take a complement before merging with the other V and with their shared specifier. This is correct: when the second verb in an RSVC is an unaccusative verb of directed motion it commonly takes a goal complement that bears no direct thematic relationship to the first verb.[17]

(33) Úyì sùá èwé lá ùvún.
Uyi push goat enter hole
'Uyi pushed the goat into the hole.'

This unshared goal phrase can be extracted out of the second VP by wh-movement processes:

(34) Ùvún òré Úyì sú!á èwé lá --.
Hole FOC Uyi push goat enter --
'It's a hole that Uyi pushed the goat into.'

This confirms the conclusion that extraction from double-headed structures is not subject to the Coordinate Structure Constraint, which we first arrived at by considering data from CCs in (16) (see also (72) below for relevant CSVC data).

5.2 Evidence from the syntax of adverbs

The claim that RSVCs and CSVCs differ in syntactic structure goes against two of the most prominent P&P-style accounts of SVCs, which attribute essentially the same syntactic structure to all "object sharing" SVCs, irrespective of the transitivity of the second verb (see Baker 1989 and (Collins 1997)).[18] In order to support this claim, we need to show that SVCs with a transitive second verb differ from those with an unaccusative verb in certain syntactic respects. Once again, the distribution of adverbs proves to be very useful in this regard.

Consider again the I-type (VP-initial) adverbs like *giegie* 'quickly'. We saw above that these adverbs can adjoin to VoiceP but not TP. Further evidence shows that they can also adjoin to vP, but not to VP. More specifically, the following descriptive generalization seems accurate:

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[17] However, there is an interesting asymmetry here: the first verb in an RSVC cannot take a complement. The reason is that the projection of the second V is itself interpreted as a kind of complement of the first verb, and there is a general constraint that a verb can only have a single delimiting complement. See section 7 for data and analysis.

[18] Campbell 1996 seems to make essentially the same distinction as the one we have in mind when he distinguishes "accusative SVCs" (our CSVCs) from "non-accusative SVCs" (our RSVCs). However, in practice the only non-accusative SVC he discusses in detail is the one with a dummy first verb, of the kind mentioned in fn. 24, and the structure he assumes for non-accusative SVCs will not work for RSVCs in general.

Dechaine 1993 distinguishes SVCs with transitive second verbs from those with intransitive verbs only by saying that the second verb is the head of the whole construction when it is transitive, whereas the first verb is the head when the second one is intransitive. This does not seem to be enough of a structural distinction to account for the syntactic differences we discuss in this section.

(35) I-type adverb placement (final).
I-type adverbs in Edo can left-adjoin to VoiceP or vP, but not to TP or to VP when it is a complement of v.

Some evidence for the last part of this generalization comes from simple facts about word order presented in (36). *Guoghọ* 'break' is a verb that, like its English counterpart, can be either unaccusative (V alone) or transitive (a conflation of v and V).

(36) a. Ì ghá gié!gié guó!ghó àkhé.
I FUT quickly break pot.
'I will quickly break the pot.'

b. Né!né àkhé ghá gié!gié guó!ghó.
the pot will quickly break.

c. *Ì ghá guó!ghó gié!gié àkhé.
I will break quickly pot.

(36)a shows that *giegiẹ* can attach to vP (or VoiceP), thereby coming before the lexicalized verb even after it has raised to v. (36)b shows that *giegiẹ* can attach to VP when there is no v present. However, (36)c shows that *giegiẹ* cannot attach to VP when it is the complement of v. This order would be derived if the adverb could adjoin to VP, while the head V moves to combine with the v (as usual) and the theme NP remains in its theta-position, presumed to be inside VP (section 6).

(37) I_i will t_i ACTIVE v $[_{VP}$ quickly $[_{VP}$ pot break]]
|_____|

This also fits with semantic intuitions: I-type adverbs can only be understood as modifying the whole event, not just the change-of-state part of the event. Thus (38) means that Ozo got around to the business of melting the fat quickly, and does not necessarily say that he caused the fat to melt quickly.

(38) Òzó gié!gié rán!rán né!né èvbí.
Ozo quickly melted the fat.

Now this generalization about adverb placement combines with our theory of double-headed structures to predict that I-adverbs will not be able to come between the two verbs of an RSVC. The reason is because there is only one vP (and one VoiceP) in an RSVC, and left-adjoining to it will cause the adverb to come before both verbs. This is correct:

(39) a. *Úyì gbé Òzó rhé!rhé wú.
Uyi hit Ozo quickly die
'Uyi beat Ozo so that he died quickly.'

b. *Òzó fí àkhé gìégìé guòghó.
Ozo throw pot quickly break
'Ozo threw the pot so that it quickly broke.'

In contrast, C SVCs contain two vPs as well as two VPs. An I-type adverb can adjoin to the second vP, in which case it will come after the object of the first verb and before the second verb:

(40) a. Òzó lé èvbàré rhé!rhé ré.
Ozo cook food quickly eat
'Ozo cooked the food and quickly ate it.'

b. Òzó vbó òkhókhò ìgàn gié!gié khién.
Ozo pluck chicken feathers quickly sell
'Ozo plucked the chicken of feathers and quickly sold them.'

This supports the claim that RSVCs and CSVCs are different in structure in the way that we claim.[19]

A similar, but not identical argument comes from a second class of adverbs in Edo. Edo also has adverbs that adjoin to the right of the verbal phrase, coming after the object and any other complements. Unlike English, these VP-final adverbs are lexically distinct from the VP-initial adverbs, so that the same forms cannot in general be used in both positions, although the two kinds may be morphologically related. For example, *giegie* is a typical I-type adverb, whereas *egiegie* 'quickly' is the form that can be VP-final. Following Stewart 1998, we call *egiegie* an N-type adverb, since the vowel prefix is probably a kind of nominalizing morphology (compare Déchaine and Tremblay's (1996) claim that the suffixes –ly in English and –mente in Romance languages are nouns). Unlike I-type adverbs, N-type adverbs are able to attach to the VP of a transitive structure. Thus, (41) has the meaning that the fat's change of state from solid to liquid was quick, but does not say anything about how long it took Ozo to get around to this task; thus, its meaning contrasts minimally with that of (38).[20]

(41) Òzó rànrán né!né èvbí ègìégié.
Ozo melted the fat quickly.

Thus, we assume that the underlying structure of examples like (41) is (42).

(42) Ozo … v [$_{VP}$ the fat melt quickly]
|_____|

[19] On this view, one would expect that an I-type adverb could also adjoin to the first vP in a CSVC, therefore modifying only the first vP. In practice, however, this interpretation is hard or impossible: I-type adverbs before the first verb are interpreted as being attached to VoiceP and thus having scope over both verbs. We leave open why this is; it may be a parsing effect rather than a true grammatical constraint. The particle *ghá* 'repeatedly' which Stewart 1998 and Baker and Stewart 1998 analyze as a functional head has the same distribution; here we tentatively treat it as an adverb similar to *giegie*.

[20] This is like the difference in interpretation between the two positions of *quickly* and *slowly* in English, as discussed in (Travis 1988:292) and (Cinque 1999:92).

The descriptive generalization is:

(43) N-type adverb placement.
N-type adverbs (including locative PPs) are right-adjoined to a maximal VP.

Now, these N-type adverbs can follow either an RSVC, or a CSVC. However, there is a difference in interpretation. After a CSVC, the adverb can be understood as modifying the event of the second verb only:[21]

(44) Òzó dùnmwún èmà khiḗn ègìégìé.
Ozo pound yam.pudding sell quickly.
'Ozo pounded the yam pudding, and sold it quickly.'

However, when an N-type adverb follows an RSVC, it can only be understood as modifying both of the resulting events:

(45) a. Òzó tié Úyì rré ègìégìé.
Ozo call Uyi come quickly
'Ozo called Uyi in quickly.'
(NOT: Ozo called Uyi so that Uyi came quickly.)

b. Òzó hòó ùkpòn fàfá ègìégìé.
Ozo wash dress fade quickly.
'Ozo quickly washed the dress so it faded.'
(NOT: 'Ozo washed the dress such that it faded quickly.')

This distinction makes sense given our theory. In RSVCs, the two Vs are merged to make a single maximal VP. N-type adverbs must adjoin to this single VP, and therefore have both verbs in their scope. In contrast, CSVCs have two maximal VPs, each contained in a distinct vP. When an N-type adverb attaches to the second of these VPs, it does not have the first verb in its scope.

An N-type adverb can adjoin to the first VP in a CSVC, in which case it comes after the object, before the second verb, and has only the first verbal phrase in its scope:

(46) Òzó lé èvbàré ègìégìé/ vbè òwá ré.
Ozo cook food quickly/in house eat
'Ozo cooked the food quickly/at home and ate it.'

In contrast, N-type adverbs cannot come between the object and the second verb in an RSVC, because there is no VP that includes the object but not the second verb in this structure:

(47) *Òzó suá àkhé ègìégìé/ vbè òwá dé.
Ozo push pot quickly/in house fall

[21] An N-type adverb can also be understood as modifying both events in a CSVC if and only if it undergoes a shift in tone to *é!gié!gié*. (Stewart 1996) takes this to be a sign of a higher attachment site, but all the details have not been fully worked out.

'Ozo pushed the pot quickly/in the house down.'

This then is an even clearer contrast between RSVCs and CSVCs. Note that locative prepositional phrases like *vbè òwá* 'at the house' have the same distribution as N-type adverbs in all these respects; see Stewart 1998 for more Edo data. Campbell 1996:89 also discusses the same contrast in Akan.

A third significant difference between RSVCs and CSVCs shows up in the so-called predicate cleft construction. Descriptively, the predicate cleft construction consists of an ordinary looking clause, preceded by a nominalized copy of the verb and the focus particle *ọre*:

(48) Ù-khiẹ́n-mwẹ̀n ọ̀ré Òzó khiẹ́n èbé.
nom-sell-nom FOC Ozo sell book
'It is selling that Ozo did to the book (he didn't give it as a gift).'

Semantically, this has the effect of putting contrastive focus on the verb. Thus, (48) presupposes that there was an event of which Ozo was an agent and the book was a theme, and asserts that the event was a selling, as opposed to something else (see (Larson and Lefebvre 1991), among others).

Now, in CSVCs in Edo, either of the two verbs can undergo predicate clefting:

(49) a. Ù-khiẹ́n-mwẹ̀n ọ̀ré Úyì lé èvbàré khiẹ́n.
nom-sell-nom FOC Uyi cook food sell
'It's selling that Uyi cooked the food and did to it.'

b. Ù-lé-mwẹ̀n ọ̀ré Òzó lé èvbàré khiẹ́n.
nom-cook-nom FOC Ozo cook food sell
'It's cooking that Ozo did to the food and sold it.'

In contrast, neither verb can be predicate-clefted from an RSVC in Edo:

(50) a. *Ù-guọ́!ghọ́-mwẹ̀n ọ̀ré Òzó fí àkhé guọ́!ghọ́.
nom-break-nom FOC Ozo throw pot break
'It's breaking that Ozo threw the pot and it did.'

b. ??Ù-fí-mwẹ̀n ọ̀ré ọ̀ fí àkhé guọ́!ghọ́.
nom-throw-nom FOC he throw pot break
'Its by throwing that he made the pot break (not by striking it).'

These facts can be related to our analysis of N-type adverbs. Following the basic idea of Manfredi 1993, we assume that the predicate cleft in an example like (48) is derived by applying *wh*-movement to a cognate object that starts out in construction with the verb. As a result, the predicate cleft shows all the usual diagnostics of *wh*-movement, including sensitivity to islands (Koopman 1984) and presence of a special floating tone on the verb (this is a *wh*-agreement marking of a kind that is common in African languages; see (Haik 1990) for survey and references). These cognate objects can also appear in their base position in Edo, without being extracted:

(51) Òzó khiẹ́n èbé ù-khiẹ́n-mwẹ̀n.
Ozo sell book nom-sell-nom
'Ozo sold the book (a selling).'

Pereltsvaig (1998) shows that in languages like Russian and Hebrew in which cognate objects can appear with all verb classes, they are adverbial in nature; Edo is another language of this kind. In essence, the cognate objects are a special type of N-adverb.[22] Then the fact that both kinds of predicate cleft are possible from a CSVC, as in (49), reduces to the fact that the two verbs in a CSVC can be separately modified by an N-type adverb, as shown in (44) and (46). In contrast, the two verbs of an RSVC cannot be modified separately by N-type adverbs, so a cognate object-adverbial could only attach to the VP that is headed by both verbs, as in (45). However, there is an additional requirement on cognate object/predicate cleft constructions, to the effect that the nominalized verb must match the verbal head of the phrase it is attached to (**Ùtiémwẹ̀n ọ̀ré Òzó khiẹ́n èbé* 'Read-NOM FOC Ozo sell book). This condition cannot be satisfied in an RSVC, because no nominalized verb will match both of the heads of the VP. Therefore, the predicate clefts in (50) are ruled out.

5.3 Against a single-headed alternative

So far, we have taken it for granted that RSVCs have a [v [V…V…]] structure, and have shown how this leads to a successful account of the syntactic properties of RSVCs, especially with respect to issues of adverb placement. However, it is fair to ask whether there are alternative views that do not make use of multiple-headedness which would be just as successful. One reasonable possibility that several people have mentioned to us[23] is that RSVCs might have a more ordinary structure with a v head dominating a single-headed VP. On this view, what is special about RSVCs is not some kind of double-headedness, but rather the possibility that distinct verb roots can be inserted into the v and V positions. More specifically, the transitive verb would not be a syntactic conflation of v and V; rather, it would be inserted directly into the v position. Technically, this might require "underparsing" the result part of the lexical representation that is normally associated with the transitive verb. On this view, the structure of an RSVC would be:

(52) $[_{TP}$ Ozo will $[_{VoiceP}$ t ACTIVE $[_{vP}$ push $[_{VP}$ pot fall]].

Here the first verb 'push' contributes the activity/process/cause part of the complex event, whereas the second verb 'fall' by itself expresses the result; the whole then means something like "Ozo caused the pot to fall by pushing." This alternative view assumes the same anatomy of the

[22] However, there is at least one syntactic difference between cognate objects and (other) N-type adverbs. When cognate objects are dislocated to the front of a clause, the clause shows the normal signs of clefting, including the focus marker *ọ́re* and a special tonal morpheme on the verb. These trappings do not appear when N-type adverbs are fronted. We put this difference aside here.

[23] Among them are Lisa Travis, Marcel den Dikken, and Heidi Harley, all of who we thank for valuable discussion. (This is not to say that the view we are arguing against is exactly what any of these linguists would endorse.)

clause as our view, but it posits a different view of serialization, and of how verb roots may associate with syntactic structure.[24]

There are several objections to this kind of alternative. First, in many cases it seems clear that the transitive first verb does contribute information about the resulting state, not just about the process by which the resulting state is reached. A clear case of this is in an example like:

(53) Òzó guòghó ékpétìn kié.
Ozo break box open
'Ozo broke the box open.'

In this sentence, 'break' doesn't name just a process of opening; rather it asserts a change of state whereby the box becomes broken just as much as in sentences where 'break' is the only lexical verb or the second verb of an RSVC. We believe that this is true for almost all first verbs, although the result part may be less distinguishable in some.

A second objection to this alternative is that if the first verb is contributing only an activity/process that is the cause of the change of state described by the second verb, then one would expect unergative verbs to fit naturally in that position. Unergative verbs are, after all, the canonical expressions of processes. If anything, they should fit better as first verbs in RSVCs than transitive verbs, because the match between their lexical semantic representations and the syntax is perfect, they having no inherent result part that needs to be underparsed. This prediction is not borne out; unergatives are systematically ungrammatical as the first verb of an RSVC:[25]

(54) a. *Ì wón úkpù ká.
I drink cup dry
'I drank the cup dry.'

b. *Ékítà gbòó Àdésúwà rhió!rré
dog bark Adesuwa wake.up
'The dog barked Adesuwa awake.'

[24]While we do not adopt this alternative for RSVCs in general, we do accept it for one special class of SVCs in Edo, namely those in which the second verb is transitive and the first is a semantically "light" verb of handling—*mu* 'carry' or *rhie* 'take'. (i) is an example:

(i) Ò mú né!né èwé (*gié!gié) gbé .
he take the goat (quickly) kill
'He killed the goat.'

Although these look superficially like CSVCs in that they consist of two transitive verbs, they act more like RSVCs, and seem to describe one simple event. For example, they do not permit an I-type adverb between the two verbs. See den Dikken and Sybesma (Dikken and Sybesma 1998) for a recent analysis of these "take-serials" in Fongbe (building on Lefebvre 1991), which we accept, plus or minus some quibbles about the details of clause structure. See also Campbell 1996:sec. 4.1 for discussion of the parallel construction in Akan—which he does not distinguish from RSVCs with a meaningful first verb (wrongly, in our view).

[25] Note that Edo RSVCs are crucially different from resultative constructions in English in this respect; unergative first verbs are possible in English. Also note that *won* 'drink' is optionally transitive (e.g. Ì wón (àmèn) 'I drink water'), so (54)a at least is not ruled out simply because there is no accusative Case to assign to the direct object.)

Our analysis predicts the ungrammaticality of these examples. For us, SVCs must have two heads of the same type that form the double-headed complement of a single higher head; in (54) the two heads are not of the same type in the relevant way.

Finally, it is significant that RSVCs can be formed from two unaccusative verbs in Edo; examples are:

(55) a. Ébólù wèrrié(*gié!gié) làdián
ball roll quickly exit
'The ball rolled (*quickly) out.'

b. Òmó dé (*gié!gié) wú.
child fall quickly die
'The child fell and (*quickly) died.'

In these examples, both the first verb and the second are verbs of the unaccusative class, and therefore the shared theme argument appears as the subject of the sentence rather than as the direct object, as a result of the NP-movement normally found in unaccusative clauses. Otherwise, these examples have the same syntactic properties as other RSVCs: no I-adverb or N-adverb can come between them, final N-adverbs cannot modify either verb separately, and neither verb can be predicate-clefted. This is perfectly consistent with our analysis. Unaccusative verbs are Vs selected by something other than a causative v head; either they are complements of a v with different semantic content (such as 'become'), or there is no vP at all and the VP is a direct complement of a tense/aspect head. Either way, serialization can take place, giving a structure like [X [V ... V]], where X= 'become' or X=T/Asp. Since there is a single maximal VP, the properties of adverbs and predicate cleft follow in the same way as before. However, the existence of this type of RSVC highlights the fact that first verb in an RSVC is not contributing a pure process, unaccusatives being the antithesis of simple process verbs.

5.4 Discussion on the v-Voice distinction

Perhaps the most theoretically significant implication of the contrast between CSVCs and RSVCs is the result that voiceP and vP are distinct categories, both appearing in the syntactic representation of a transitive clause. These have usually been taken to be two different labels for the same head, one used by Chomsky 1995 and the other by Kratzer 1996. However, if we take v to refer to that element which makes a clause transitive rather than unaccusative, adding a causative ingredient to the meaning of the clause, while voice is essentially the element that adds an agent argument to the clause, then the two are logically distinct. Taking them to be distinct categories in fact, we arrive at a fine-grained enough representation that we can distinguish CSVCs from both RSVCs and CCs. CSVCs differ from RSVCs in having enough structure to license two transitive verbs—so they have two v nodes—but they can have only a single subject position—so they have only one Active Voice head.

At first we were surprised by this result ourselves, but it now seems to us that there is other, more familiar evidence for the same distinction. For example, consider the familiar contrast between passives and unaccusative verbs:

(56) a. The ship sunk (*to collect the insurance).
b. The ship was sunk (to collect the insurance).
c. The navy sank the ship (to collect the insurance).

In the current framework of assumptions, (56)a is the result of choosing a noncausative v (or no v at all), rather than a causative v. On the other hand, (56)b is the result of choosing a nonactive Voice rather than an active one. The effect is not the same; in particular, (56)b is like (56)c in asserting that the sinking event had an external cause. Thus, these examples also suggest that v and Voice are different categories.

Similar implications come from certain other domains. For example, a derived nominalization such as *the constant assignment of unsolvable problems* (Grimshaw 1990:50) presumably has (the equivalent of) a causative element (v) to license a transitive verb root, but it has no agent position (and hence no Voice). Similarly, many causative morphemes in languages of the world probably (may) select a vP complement rather than a VoiceP; as a result, the complement has a transitive verb, but no agentive subject. A well-studied example of this is the so-called *faire-par* construction of French, Italian and other Romance languages (Italian*: Maria fa riparare la macchina* 'Maria makes (be) repaired the car' (Burzio 1986:sec. 4,2)). These then can be seen as other manifestations of a truth that SVCs show clearly: that Voice and v are two distinct bones in the skeleton of the clause, with a joint between them.

6. On the position of themes

So far our focus has been on the head positions in the clausal anatomy; now we wish to see what can be learned about argument positions from this kind of investigation. We have already learned something about where the agentive subjects appear in the course of distinguishing VoiceP from vP on the one hand and TP on the other hand. In the next two sections we consider the other major classes of arguments: direct object/themes, and indirect object/goals. We begin with themes.

6.1 Two kinds of object sharing

Just as the position and interpretation of adverbs reveals a three-way distinction among SVCs, so there is a three-way split in how the object is treated. First, CCs that contain two transitive verbs also contain two objects, one for each verb. This is unremarkable, and similar to VP coordination in English. In contrast, both CSVCs and RSVCs have only one overt object that seems to express the theme argument of both verbs. This is the important "object sharing" property of (true) SVCs, studied by Baker 1989, Campbell 1996, Collins 1997, and others. However, there is interesting evidence for a subtle difference in the treatment of the theme-object in CSVCs and RSVCs as well. In particular, there is evidence that there is an empty category object associated with the second verb in the CSVC, but not in the RSVC.

Syntactic evidence for this difference between CSVCs and RSVCs comes from the distribution of *tobore* 'by oneself'. In section 3 we saw that this element can be right-adjoined

to NPs, including certain null ones (although not *wh*-traces). As expected, *tobọre* can be adjoined to the overt object in both types of SVC. More interestingly, Stewart 1998:67-68 observes that *tobọre* can also follow the second verb in the CSVC, and still be interpreted as modifying the "shared object":

(57) a. Òzó dé ìyán$_k$ dùnmwún (--) tòbórè$_k$
Ozo buy yam pound by.self
'Ozo bought the yam and pounded it by itself.'

b. Òtàsówié dé éwù$_k$ yó (--) tòbórè$_k$
Otasowie buy dress wear by.self
'Otasowie bought the dress and wore it by itself.'

Strikingly, however, *tobọre* cannot follow the second verb in a RSVC with this interpretation:

(58) a. *Òzó kòkó Àdésúwà$_k$ mòsé (--) tòbórè$_k$
Ozo raise Adesuwa be.beautiful by.self
'Ozo raised Adesuwa to be beautiful by herself.'

b. *Òzó sùá ògó$_k$ dé (--) tòbórè$_k$
Ozo push bottle fall -- by.self
'Ozo pushed the bottle down by itself.'

These facts strongly suggest that there is an empty category NP in the projection of the second verb in the CSVC which *tobọre* can adjoin to. This is what one might expect, given the Projection Principle of (Chomsky 1981). However, there is apparently no such category in the projection of the second verb in the RSVC; hence, there is nothing suitable for *tobọre* to adjoin to, and the structure is ruled out.[26] The examples in (58) contrast minimally with the simple unaccusative structures in (59), where the same argument and verb appear outside of a RSVC. In these circumstances, *tobọre* can come after the verb, where it is adjoined to the trace left in VP when the theme argument moves to subject position.

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[26] More precisely, these examples show that there is no empty category *after the second verb*. It could still be that there is an empty category before the second verb, in the specifier position of a VP headed by that verb, as in (i). (This is the structure that Collins 1997 assumes for this class of examples.)

(i) [$_{vP}$ Ozo push$_i$ [$_{VP}$ Uyi$_k$ t$_i$ [$_{VP}$ pro$_k$+ *tobọre*$_k$ fall]]

This structure predicts that *tobọre* should be able to follow the object without forming a constituent with it, because it is adjoined to *pro*. In that case, the object *Uyi* should be able to extract, leaving *tobọre* behind. This is clearly not the case:

(ii) *Úyì òré íràn sú!á tòbórè dé
Uyi FOC they push by.self fall.
'It's Uyi that they pushed down by himself.'

This then completes the argument from the distribution of *tobọre* that there is no empty category object associated with the second verb in an RSVC.

(59) a. Úyì dé tòbórè.
Uyi fall by.self
'Uyi fell by himself.'

b. Àdésúwà mòsé tòbórè.
Adesuwa be.beautiful by.self
'Adesuwa is beautiful by herself.'

Thus, RSVCs seem to have a single object position in the syntax that functions as the argument of both verbs, similar to the true object-sharing analysis of Baker 1989. On the other hand, CSVCs seem to involve two NPs, one overt, and the other an empty category that is coindexed with the first, similar to the analyses of Law and Veneestra (1992), Dechaine 1993, Campbell 1996, and Collins 1997.

One can get further insight into this structural distinction between the RSVC and the CSVC by using an NP with a numeral or quantifier as the object between the two verbs. Thus, the following examples differ in their interpretation in an interesting way:

(60) Òzó sùá èrhán khérhé dè-lé. RSVC
Ozo push tree few fall-PL
'Ozo pushed a few trees down.'

(61) Òzó dé èbé khéhré tìé. CSVC
Ozo buy book little read
'Ozo bought a few books and read them.'

The RSVC in (60) has a simple conjunctive reading: it means that there are a few pots that are such that Ozo pushes them and they fall. It can be true of a situation in which Ozo pushes many pots, but most of them stay upright, and of a situation in which many pots fall, but most of them do so as the result of an earthquake. However, the CSVC in (61) has a slightly different reading: it implies that Ozo bought only a few books in total. (61) also implies that Ozo read all of the books that he bought. This sentence is judged to be false of a situation where Ozo is a typical academic who buys many books but only gets around to reading a few of them. Now this pattern of inferences is familiar from the literature on E-type pronouns in English (Evans 1980). (61) is comparable to Evans' well-known example in (62).

(62) Few senators admire Kennedy, and they are very junior.
==> Few senators admire Kennedy, and
==> All the senators that admire Kennedy are very junior.

Even more to the point, the intuitions about (61) in Edo are similar to those for the English translation with VP conjunction and a pronoun in the second conjunct that is related to the quantified object in the first conjunct. This not only confirms that there is a null object associated with the second verb in the CSVC, it tells what kind of empty category that object must be: it must be a null pronoun that is not c-commanded by the object of the first verb.[27] Only such

[27] On this point, we agree most closely with Déchaine 1993:ch. 4. However, Déchaine does not distinguish between CCs and CSVCs, and thus she says that the object of the second verb may be *pro*, but not that it must be.

pronouns give an E-type interpretation; all other empty categories (NP-traces, PRO, wh-traces, bound pros) are interpreted as simple bound variables. This then argues against proposals in which the empty category is a controlled *pro* (or PRO) (Collins 1997) and proposals in which it is a variable bound by a null operator ((Carstens 1988), (Larson 1991:204), Law and Veneestra 1992, and entertained by Campbell 1996). Furthermore, the absence of this kind of E-type reading for (60) is consistent with our claim that there is no comparable empty category in the RSVC.

Interestingly, the distinction revealed by subtle tests in Edo is sometimes manifestly apparent in Akan. Akan allows SVCs that are parallel to the CSVCs of Edo, such as:

(63) Ama at<u>o</u> aduan$_i$ adi [e]$_i$ (Saah 1992:234)
Ama has.bought food has.eaten *pro*
'Ama has bought food and eaten it.'

However, Saah 1992 shows that Akan (unlike Edo) generally allows null pronominal objects *if and only if the referent of the pronoun is inanimate*. He then makes the important observation that when the shared object of an SVC formed from two transitive verbs is animate, an overt object pronoun necessarily follows the second verb:

(64) Kofi bOO Ama$_i$ kuu no$_i$. (Saah 1993:235)
Kofi hit Ama kill her
'Kofi hit Ama and killed her.'

This strongly suggests that a pronoun is always present in this position, but it is predictably null in (63) (see also Campbell 1996:90). Saah does not discuss SVCs with an unaccusative second verb, parallel to the Edo RSVCs, but relevant examples can be found in other sources. (65) is such an example with an animate shared theme; note crucially that this time there is no pronoun that is associated with the second verb and coreferent with the animate object of the first verb.

(65) Kofi frE Yaw ba. (Campbell 1996)
Kofi calls Yaw come
'Kofi calls Yaw to him.'

Thus, under the right circumstances, Akan shows overtly the same basic contrast between CSVCs and RSVCs that Edo has covertly.

Taken together, these data show that even though the RSVC and the CSVC both have a kind of object sharing, they implement object sharing in quite different ways. RSVCs have object sharing in the most literal sense: the two verbs have only a single NP position in the syntax, which they both theta-mark directly. In contrast, the two verbs in a CSVC share in a less direct way: the two verbs have distinct objects syntactically, but the second is a null pronominal that necessarily takes the first as its antecedent. Why should this subtle distinction exist?

The obvious answer is that this is a necessary consequence of a fundamental feature of clausal anatomy; more specifically, it follows from where the theme/object is generated within the skeleton of heads. In frameworks that assume a decomposition of transitive verbs into a higher, causative element (v) and a lower, resultative element (V), the standard place to generate

the theme object is as the specifier of the lower element (VP).[28] This fits well with the intuition that the theme is an inherent part of characterizing the state that results from the event, whereas the agent is not. It also gives compositional semantic grounding to the well-known fact that agents are higher than themes on the thematic hierarchy, and agents typically asymmetrically c-command themes (see Baker (1997) for some discussion). Now RSVCs are formed by serialization at v-V joint. As such, they contain one v, and two Vs. This characterization is met by a structure in which the two lower Vs share a single specifier, as shown back in **(31)**. There is no need for a second specifier in this configuration, so none is generated (see also fn. 16).

These considerations force CSVCs in a different direction. We have shown that CSVCs involve serialization at the Voice-v joint: therefore, they have two vs. Now, if they have two vPs, then they must also have two distinct VPs, one for each v. These VPs in turn must each contain a theme NP. Hence, radical object sharing is not a possibility in this case. The closest approximation is to have two distinct objects syntactically, where one is some kind of antecedent of the other, as shown in the structure back in **(19)**.

In short, we have found new support for the standard view that objects are generated inside VP, not vP: constructions with two distinct VPs must have two distinct objects, but constructions with only one (complex) VP need have only one object. Therefore, the object goes along with the VP.

It is worth emphasizing that these kinds of evidence give different results for the subjects of CSVCs. We have already seen in section 4 that the distribution of *tobore* shows that there is no second subject position associated with the second verb of a CSVC, even though there is a second object position (see **(18)**). Using quantified NPs as subjects confirms this result. (66) is a CSVC comparable to (61), but where the "shared subject" is a quantified NP rather than the "shared object":

(66) Èvbó khérhé dé LGB tìé.
People few buy LGB read
'Few people buy LGB (Lectures on Government and Binding) and read it.'

This sentence has a simple conjunctive reading, not the kind of reading that is characteristic of E-type anaphora. In particular, it does not imply that only a few people bought LGB; nor does it imply that all the people who bought it read it. The sentence is still considered true if many people bought LGB simply to put on their coffee tables so they could look sophisticated. In this, it is similar to the English VP coordination used in the translation of (66). Thus, CSVCs must have a null pronoun associated with the object position, but need not have one associated with the subject position: radical subject sharing is possible even in a structure that has no radical object sharing. This gives a new kind of evidence for the fundamental syntactic fact that subjects are generated in a higher position than objects, fleshing out an embryonic argument in favor of Voice Phrases mentioned in Kratzer 1996:119.

[28] However, it is important to realize that there is nothing logically necessary about this choice. Indeed, other views are occasionally entertained in the literature. For example, the "alternative theory" in Parsons 1990:sec.6.9, translated into our terminology, would have both the agent and theme generated in the projection of the causative element v. On the other hand, Borer (1998) has suggested that both agent and theme are inherently undifferentiated arguments of the verb at the bottom of the structure (corresponding roughly to our V). The considerations in the text show that these alternative views are not correct.

6.2 Remarks on the null pro *in CSVCs*

At this point, several interesting questions arise about the null *pro* in the CSVCs. One question is why the object of the second verb may be *pro,* given that object *pro*-drop is not licensed in most environments in Edo. Even more perplexing is the question of why the object of the second verb must be a pronoun at all, and cannot be some other kind of NP. Superficially, strings in which an overt object is present in the second VP are possible, but they always have the syntactic and interpretive properties of a CC, not a CSVC. For example, whenever an I-type adverb before the first verb has scope over both verbs (a diagnostic for CSVCs, as shown by the contrast between (26) and (27) in section 4), the object of the second verb must be *pro*. It is not clear why these properties should hold. To answer these questions properly would require a full-length study in itself. However, we are in a position to give some hints as to where we think the answers must lie.

Consider first the more fundamental question of why the object of the second verb in the CSVC must be coreferential with the object of the first verb. The fact that the object of the second verb is interpreted as an E-type pronoun tells us that this probably cannot be a purely syntactic phenomenon. In all of the well-studied syntactic environments in which an NP is necessarily linked to an empty category, the empty category is interpreted as a bound variable. Therefore, we suggest that CSVCs in which the object of the second verb is not a pronoun coreferential with the object of the first verb are syntactically possible, but they fail to receive a coherent interpretation at the Conceptual-Intentional interface.

The special interpretive property of CSVCs that emerges from what we have already seen is that the two distinct events described by the two transitive verbs in the construction are understood as constituting a single, coherent, larger-scale event. This showed up most clearly in section 4, where we saw that the large-scale event has a single agent (the surface subject) and must be a unified plan of that agent. Some of the facts about the interpretation of adverbs in CSVCs also point to this conclusion, assuming that this class of adverbs are predicates of events (following the Davidsonian approach of (Parsons 1990) and others). N-type adverbs in CSVCs are generally understood as predicates of the individual events described by the verbs that they most closely follow. However, I-type adverbs that come before the first verb of the CSVC are not interpreted as predicates of either subevent, but rather as predicates of a larger-scale event that has these two events as proper subparts. In these respects, CSVCs are minimally different from CCs, in which the two events described by the verbs need not constitute the unified plan of a single agent, and may not both be modified by a single adverb. Now it would be desirable to show that the requirement that the object of the second verb be coreferential with the object of the first one in CSVCs (but not CCs) also follows from the fact that the CSVC must be interpreted as a single composite event. This is the intuition we want to pursue.

For concreteness, let us suppose that the Interpretive component includes a function COMBINE which maps ordered pairs of events onto larger-scale events that include the original events as subparts:

(67) Let e, f, and g be events. Then COMBINE (e, f) = g only if e is a part of g, and f is a part of g.

This then is what the Conceptual-Intentional system uses to assign a coherent interpretation to the two verbal phrases it encounters in a CSVC. Note that (67) is an incomplete characterization of COMBINE, which seems to be only a partial function on pairs of events; this captures the

often-observed fact that the two verbs in a CSVC must form a "natural pair". Thus, (68)a is a good CSVC but (68)b is not in Edo, event though (68)b expresses a possible sequence of events. (The first event can even lead to the second one, as in the case where Ozo reads a book in a bookstore, likes it and decides it will make a useful reference book, and therefore chooses to buy it.)

(68) a. Òzó dẹ́ èbé tié.
Ozo buy book read
'Ozo bought a book and (then) read it.'

b. *Òzó tié èbé dẹ́.
Ozo read book buy
'Ozo read a book and (then) bought it.'

So COMBINE is defined for the pair (buy, read), but not for the pair (read, buy). In general, COMBINE is more restricted than a simple mereological summing operation which can apply to any pair of events (as expressed, perhaps, by overt conjunctions like *and*).

The second crucial step in this sketch is to say something about the themes of COMBINEd events. It is clear from many kinds of phenomena that the NPs that express the theme argument of a verb play a special role in individuating the event described by the verb (compare Carlson 1984:274-75). For example, Tenny (1994) and others discuss how the theme-objects of many verbs "measure out" the event and therefore contribute to the aspectual properties of the VP as a whole. Another familiar example is the French Quantification at a Distance construction studied by Obenhauer (1984), in which adverbial quantification over a VP is the near-equivalent of determiner quantification over the theme-object of that VP. Now CSVCs are special in that they describe linguistically a large-scale event that has no syntactic structure that is uniquely designated to expressing that event. Where then can this large-scale event get a theme to measure its progress and to distinguish it from other events of the same type? We suggest that the theme of the large-scale event is inherited from the smaller events that make it up. This seems very natural: if x is the theme of an event e, then x undergoes a change of state or location in e, by definition. Moreover, if e is part of a larger event g, then x undergoes a change of state or location in g as well. Therefore, x is a natural candidate to be the theme of g, in the absence of some other kind of specification. For concreteness, we can express this as the following axiom, which we understand as another part of the characterization of the interpretive function COMBINE:

(69) Theme(e, x) and (g = COMBINE(e, f) or g = COMBINE(f, e)) → Theme (g, x)

Finally, suppose that each event can only have one (possibly complex) theme, as in (70); this is a special case of the thematic uniqueness condition proposed by (Carlson 1984:273) and others.[29]

(70) For all e, Theme(e, x) and Theme (e, y) → x = y.

From these premises, we can now derive the result that the object of the second verb in a CSVC must be coreferential with the object of the first verb. Take, as an illustrative example, the

[29]We use Carlson's condition here because it is simple, explicit, and familiar, putting aside issues of plural NPs as themes, where the condition may break down. Indeed, there are weaker conditions on thematic roles than Carlson's that would serve our purposes just as well (thanks to Paul Pietroski for discussion of this point).

CSVC in (68)a, with V1 'buy', V2 'read', and object of V1 'the book', and an arbitrary object of V2, call it y. Since it is a CSVC, there is a third event g, equal to COMBINE(buy(the book), read(y)), by (67). Now the theme of the buying event is the book; therefore, the theme of the large event g is also the book, by (69). At the same time, the theme of the buying event is y; therefore, the theme of the large event g is also y, again by (69). Therefore, it follows from Thematic Uniqueness in (70) that y must be the book. In this way, we derive the fact that the object of the second verb must be coreferential with the object of the first verb from the fact that the two verbs are interpreted as forming a single event of a particular kind in CSVCs, together with the special relationship between themes and events.

A positive consequence of this way of looking at things is that it accounts for an asymmetry between theme arguments and goal arguments in SVCs. Events can have goals associated with them, but there is no fundamental requirement that they must, or that they are individuated by their goals. In particular, there is no reason to say that the big event described in a CSVC needs to have a goal argument. Therefore, the subevents do not need to have goals that the big events can inherit, and even if they do have a goal, it need not count as a goal of the whole. In short, there is no axiom like (69) with the goal relation substituted for the theme relation. Therefore, we predict that there will be no special restrictions on goal phrases in a CSVC. Goal phrases can appear in either VP, or in neither one, or in both. Moreover, if goal phrases appear in both VPs, they need not be identical. This prediction is correct, as shown by the following range of examples:

(71) a. Òzó rhié ùkpòn$_i$ yè ékpétìn khién *pro*$_i$. PP in VP1
Ozo put cloth into box sell *pro*
'Ozo put some cloth into a box and sold it (the cloth).'

b. Òzó dé àkhé$_I$ rhié *pro*$_I$ yè ékpétìn. PP in VP2
Ozo buy pot put *pro* into box
'Ozo bought a pot and put it in the box.'

c. Òzó vbò-ló òkhókhò ìgàn$_i$ khién *pro*$_i$. IO in VP1
Ozo pluck-PLchicken feathers sell *pro*.
'Ozo plucked the chicken of feathers and sold them.'

d. Òzó mién íghó$_i$ (gié!gié) hàé Úyì *pro*$_i$. IO in VP2
Ozo find money (quickly) pay Uyi *pro*.
'Ozo found some money and (quickly) payed Uyi it.'

e. Òzó vbó òkhókhò ìgàn$_i$ rhié *pro*$_i$ nè Úyì. IO in VP1, PP in VP2
Ozo pluck chicken feather give *pro* to Uyi.
Ozo plucked the chicken of its feathers and gave them to Uyi.'

We note also in passing that (the NP component of) one of these goal phrases can easily be extracted from either VP by *wh*-movement processes, as shown in (72). This is true even though the extracted goal phrase has no direct connection with the other VP, so the extraction is not of the "Across the Board" type.

(72) a. Ékpétìn òré Òzó rhié ùkpòn$_i$ yì -- khién *pro*$_i$.
box FOC Ozo put cloth into -- sell *pro*
'It's a box that Ozo put some cloth into and sold it (the cloth).'

b. Ékpétìn òré Òzó dé àkhé$_i$ rhié *pro*$_i$ yì --
box FOC Ozo buy pot put *pro* into --
'It's a box that Ozo bought a pot and put it in.'

Thus, we see again that true double-headed structures are not subject to the Coordinate Structure Constraint, unlike structures that have an overt conjunction like *vbè* 'and' (compare (16)).

The examples in which the goal argument shows up as the first object in a double object construction also show that the coreferential NPs in a CSVC need not necessarily match in the kind of Case they receive. It is common to assume that the first object in a DOC gets a structural accusative Case and the second some kind of inherent Case (as in Baker 1988 and others). Then in (71)c the *pro* in the second VP does not have the same Case as its antecedent in the first VP. However, it is crucial that both *pro* and its antecedent must be the theme arguments of their respective verbs. Thus, the following examples are impossible, because one of the NPs is marked goal, not a theme. The fact that the goal gets the same accusative Case as the theme in these examples does not rescue them:

(73) a. *Òzó vbò-ló òkhókhò$_i$ ìgàn khién *pro*$_i$. Goal bad as antecedent
Ozo pluck-PL chicken feathers sell *pro*.
'Ozo plucked the chicken of feathers and sold it.'

b. *Òzó mién Úyì$_i$ hàé *pro*$_i$ íghó. Goal bad as pronominal.
Ozo find Uyi pay *pro* money.
'Ozo found Uyi and paid him money.'

Third, this account predicts that CSVCs cannot be built up out of ECM-type constructions. Edo has such a construction created by the causative verb *ya* (Baker and Stewart 1996). Such constructions have direct objects in the Case-theoretic sense, so on the surface they look like the kinds of construction that can form a CSVC. However, in (74) the theme of one verb is the ordinary object NP 'metal', whereas the theme of *ya* is (if anything) the small clause [the metal (is) flat]. Since these two theme arguments are not coreferential, no coherent CSVC can be formed.

(74) a. * Òzó yá [èmá!tón$_i$ pèrhé]khién *pro*$_i$. ECMed subject bad as antecedent.
Ozo make metal be.flat sell *pro*.
'Ozo made some metal flat and sold it.'

b. * Òzó dé èmá!tónᵢ yá [*proᵢ* pèrhé]. ECMed subject bad as pronominal.
Ozo buy metal make*pro* be.flat.
'Ozo bought some metal and made it flat.'

Finally, this account correctly explains the otherwise curious fact that unergative verbs cannot participate in CSVCs as either the first verb or the second verb. Some examples of this are:

(75) a. * Ékítà (gié!gié) gbòó khú áhiánmwèn.
dog (quickly) bark chase bird.
'The dog (quickly) barked and chased a bird.'

b. *Ékítà khú áhiánmwèn gbòó.
Dog chase bird bark
'The dog chased a bird and barked.'

In terms of syntactic structure, unergatives are comparable to transitive verbs in that they are formed from a v+V configuration. One might then expect that they are similar enough to form CSVCs. Moreover, the examples in (75) contain plausible sequences of events, which could constitute a unified plan on the part of the dog. However, the dynamics of themehood in composite events correctly rules such examples out: in both (75)a and (75)b, the bird is the theme of the chasing event; therefore it must also be the theme of the composite event and of the barking event. However, the bird is not the theme of the barking event; either that event has no theme, or its theme is the cognate object 'a bark', which cannot refer to a bird.[30] In summary, then, this approach in terms of the interpretation of complex events characterizes in some detail the kinds of CSVCs that can be formed.

So far, we have discussed why the theme-objects of the two verbs in a CSVC must be coreferential. However, there are a number of ways in which this requirement could in principle be implemented: either NP could be a definite description, an overt pronoun, or (given suitable licensing conditions) a *pro*. In practice, only one combination is possible: the object of the first verb must be a full NP or an overt pronoun, and the object of the second must be *pro*. We will

[30] This is essentially Hale and Keyser's (1993) analysis of unergative verbs, where they are derived at some level of analysis from a semantically light transitive verb and a fixed object: for example, *The dog barked* comes from *The dog made a bark* by some kind of conflation between *make* and *bark*. Given this, we can even extend the idea in the text to explain why CSVCs cannot even be formed from two unergative verbs:

(i) … *Òzó gié!gié rhú!lé sá!án.
… Ozo quickly run jump
'(To win the atheletic contest), Ozo quickly ran and jumped.'

(ii) … *áhiánmwèn gié!gié tín só.
… bird quickly fly shout
'(To protect her babies,) the bird quickly flew and shouted.'

In (i), the theme of the running event is a run, and the theme of a jumping event is a jump. Since runs cannot be jumps, COMBINE cannot apply to give a coherent single-event interpretation. At best, the examples in (i) and (ii) could be CCs, in which case the second verb cannot be under the scope of the I-type adverb.

not try to explain precisely why this is true; however, it is worth pointing out that this situation is not unique in the grammar of Edo. The theme object can also be *pro* when it occurs in the consequent clause of a conditional sentence and there is an indefinite NP that can be its in the condition clause (Collins 1997:480-81 first discovered this parallelism in Ewe).

(76) Ètísà ghà dẹ̀ èbé$_i$, ì ghá tiè *pro*$_i$.
Teacher COND buy book, I FUT read *pro*.
'If the teacher buys a book, I will read it.'

Moreover, the *pro* in the matrix clause of the conditional is interpreted as a E-type/donkey pronoun, just as the *pro* in CSVCs is. The *pro* in (76) cannot be replaced with an overt pronoun or full NP without losing its characteristic E-type reading; in this respect too it is like the CSVC. (There is, however, the predictable difference that losing the E-type reading is fatal to the CSVC for the reasons described above, but it is not fatal for the conditional clause: with an overt pronoun it is well-formed but has a different meaning from (76).) Finally, it is impossible for the *pro* and the NP to switch places, such that the dependent *pro* is in the antecedent clause and the independent noun phrase is in the consequent clause of the conditional construction. This is parallel to the fact that it is impossible to reverse order of the *pro* and the NP in a CSVC:

(77) * Ètísà ghà dẹ̀ *pro*$_i$, ì ghá tié èbé$_i$.
teacher COND buy *pro*, I FUT read book.
'If the teacher buys it, I will read a/the book.'

(78) *Òzó gié!gié dé *pro*$_i$ tié èbé$_i$.
Ozo quickly buy *pro* read book
'Ozo quickly bought and read a/the book.'

For the most part, these facts are not especially remarkable: it is normal for a full NP to precede a pronoun that depends on it, and it is normal for the most reduced form of a pronoun to be used when the most dependent reading is intended. Presumably the kind of dynamic-semantic theories that are currently used to explain these effects in discourse in general and donkey-anaphor contexts in particular can also be applied to CSVCs to get similar results. Something extra has to be said about why *pro* is licensed in conditional clauses, but it seems reasonable to conjecture that whatever is licensing the *pro* there is also licensing it in CSVCs. Filling in the specifics to properly capture these generalizations is a highly nontrivial exercise, but it is not one we need to undertake here in the course of pursuing the themes of double-headedness and clausal anatomy.

7. On the position of goal and source expressions.

Having discussed the positions of agents and themes in some detail, we lastly turn to the question of what serialization phenomena can tell us about where indirect objects appear in the anatomy of the clause. These indirect objects typically bear a goal/benefactive or source/malefactive thematic role, and they are the first object of a double object construction. Their exact position in the clause both underlyingly and on the surface has been a source of continuing controversy in the literature.

In Edo, a very small number of verbs select for a goal object as well as a theme object, producing a double object pattern comparable to the one found in English:

(79) a. Òzó màá Úyì èbé nà.
Ozo show Uyi book this
'Ozo showed Uyi this book.'

b. Òzó hàé Òtà íghó.
Ozo pay Ota money
'Ozo paid Ota money.'

However, this pattern is not common or productive. What is much more productive in Edo is examples like (80), in which a transitive verb takes an additional NP that is understood as a source and/or an adversely affected participant in the event.

(80) a. Òzó rhié òmó ébólù..
Ozo take child ball
'Ozo took the ball from the child.'

b. Òzó guòghó Úyì èmá!tón
Ozo break Uyi metal
'Ozo broke Uyi's metal on him.'

In this respect, Edo is the opposite of English, in which *Ozo took the child a ball* would mean that Ozo took the ball to the child, not that he took it from the child. However, the syntactic properties of the double object construction in (80) are virtually identical to those of the more familiar double object construction in (79). Therefore, we collapse the two cases into one, assuming that they have the same syntactic structure and differ only in the polarity of the motion of the theme with respect to the indirect object.

The question at hand is where are the IOs in examples like (79) and (80), and how do they come to be there. Considering only surface linear order, it looks like the IO is lower than the final position of the verb in v and higher than the DO. The higher position of the IO can be confirmed by Edo versions of the standard Barss-Lasnik tests, which show that the IO asymmetrically c-commands the DO in double object constructions (see (Barss and Lasnik 1986), Larson 1988). Perhaps the simplest and most widely assumed way of accounting for this positioning is to assume that the IO is introduced as the specifier of an additional "light verb" that selects the basic VP as its complement; this light verb is itself embedded inside the head that introduces the agent argument (v or voice, depending on the theory). This view is taken by (Marantz 1993), (Bobaljik 1995), and (Ura to appear:ch. 7) among others; it is popular in Minimalist work because it fits comfortably with Chomsky's "Shortest Move" conditions.[31] On this view, the structure underlying a double object construction is roughly:

[31] Others, such as (Collins and Thráinsson 1996) agree that the IO is generated higher in the structure than the DO, but do not say that it is introduced by a distinct verbal element: for them the IO is generated in the specifier of the same root verb that takes the DO as a complement. This theory does not have exactly the same joints as the one discussed in the text, but it might also predict wrongly that SVCs like (83) could be possible. In particular, (83) could be formed if the two V-bars join first, and then merge with the IO specifier.

(81) $[_{VoiceP}$ AGENT Voice $[_{vP}$ v $[_{ApplP}$ GOAL/SOURCE Appl $[_{VP}$ THEME V]]]]

Marantz 1993 in particular equates the IO-introducing light verb with the applicative morpheme that appears on ditransitive verbs in many languages; following him, we call it "Appl" for ease of reference (Ura calls it "Vmid", for "middle V"). The structure in (81) also transparently reflects a common version of the thematic hierarchy, in which the agent outranks the goal, and the goal outranks the theme.

In spite of its conceptual simplicity, this view is not supported by the facts of SVCs in Edo. The clausal structure in (81) crucially has a joint between the Appl head and the basic VP. Then, all things being equal, one would expect that serialization could happen at this joint, with the VP complement of Appl being doubly headed The result would be a variant of the RSVC, in which there are two verbs (one transitive and one unaccusative, since there is only one v) but only one IO. The structure would be as in (82), where the first V in VP raises through Appl to v, just as the only verb does in (81).

(82) $[_{VoiceP}$ Ozo ACT $[_{vP}$ hit $[_{ApplP}$ Uyi t_V $[_{VP}$ metal t_V break]]]]

However this prediction is clearly false; no such structure is possible, even when both the first verb and the second can support a double object structure used by themselves:

(83) a. *Òzó rhié Àdésúwà èbé màá.
Ozo take Adesuwa book show
'Ozo showed Adesuwa a (her) book.'

b. *Òzó gbé Úyì èmá!tónguòghó.
Ozo hit Uyi metal break.
'Ozo beat Uyi's metal to pieces.'

(Note that 'hit' and 'break' form a good RSVC in the absence of an IO: *Ozo gbe ematon Uyi guoghо* 'Ozo beat metal of.Uyi break'). Thus, the "middle verb" view of double object constructions makes a wrong prediction when combined with our general theory of serialization. In short, our methodology uncovers no evidence of a joint here where one was predicted to be.

The alternative theory of double object constructions is that goal and source phrases are systematically generated lower than the theme, as the complement of V; however, under some circumstances they may move to a position higher than the theme for Case theoretic reasons (Larson 1988, Baker 1989, (Baker 1996, Baker 1997)). In fact, there is a whole class of goal-like phrases which appear overtly as the complement of V, following the direct object:

(84) a. Òzó hàé íghó nè Úyì goal PP
Ozo pay money to Uyi
'Ozo paid some money to Uyi.'

b. Òzó suá èbé yè ékpétìn goal PP
Ozo push book into box
'Ozo pushed a book into the box.'

c. Òzó gié Àdésúwà òwá. bare locative NP
Ozo send Adesuwa house
'Ozo sent Adesuwa home.'

d. Òzó guòghó àkhé gièghègièghè resultative AP
Ozo break pot small-pieced
'Ozo broke the pot into little pieces.'

e. Òzó fí àkhé fuá. particle.
Ozo throw pot away
'Ozo threw a pot away.'

Semantically, all of these elements act as delimiters: they express the final state or location of the theme as a result of the event, and they make the VP into an accomplishment (if it wasn't one already). Moreover, in these cases the theme DO acts like it asymmetrically c-commands the goal by Barss-Lasnik tests where these can be constructed. The standard Larsonian analysis of these constructions is to say that the goal is the complement of the lower verb, and the theme is its specifier. The lower verb then moves to the higher v position, deriving verb-theme-goal order.

(85) NP_{ag} Voice V_i $[_{VP}$ NP_{th} $[t_i$ $XP_{go}]]$

So far, this is perfectly straightforward. In addition, one finds that one can generally only have one of these goal-like phrases in a single clause. This is illustrated by data like the following:

(86) a. *Òzógié Àdésúwà èkì gié Úyì / gié Úyì èkì. *PP+loc. NP/*loc.NP+PP
Ozo send Adesuwa (to)market to Uyi / to Uyi (to)market

b. *Òzó fí àkhé yè òtíkù fuá. *PP+Prt
Ozo throw pot in trash away

Facts like these have an immediate structural explanation if, in addition to fulfilling similar semantic roles, these delimiting phrases all compete for insertion in the unique complement-of-V position:

(87) Delimiting goal expressions must be generated in the (unique) complement position of V.

It is not crucial for our purposes whether this effect is ultimately semantic in nature—saying that there can be only one delimiter—or syntactic in nature—saying that there can be only one complement; we will focus on the syntactic side, be it cause or effect.

Now consider in this light the animate goal/source NPs found in DOCs. Semantically, these are goals in that they describe where the theme is (or, in the case of sources, where it isn't) at the end of the event. They also give the event an endpoint, making it telic, just as the other goal-like expressions in (84) do:

(88) Òzó gbé (*Àdésúwà) èmá!tón là àwá ókpá.
Ozo beat Adesuwa metal for hour one
'Ozo beat (Adesuwa's) metal (*on her) for an hour.'

This makes it reasonable to say that these animate goal NPs also fall under the generalization in (87). This predicts that IOs will be in complementary distribution with each of the goal expressions in (84), just as those goal phrases are in complementary distribution with each other. The following examples show that this prediction is correct:

(89) a. Òzó rhié (*Úyì) ébólù yè òtíkù *IO+goal PP
Ozo put Uyi ball into trash
'Ozo put (Uyi's) ball in the trash (*on him).'

b. Òzó gié (*Àdésúwà) òmóÈdó. *IO+loc. NP
Ozo send Adesuwa child (to)Benin
'Ozo sent (Adesuwa's) child to Benin City (*on her).'

c. Òzó kòkó (*Àdésúwà) òmómòsèmòsè *IO+resultative AP
Ozo raise Adesuwa child beautiful
'Ozo raised (Adesuwa's) child to be beautiful (*for her).'

d. Òzó fí (*Úyì) ébólù fuá *IO+particle
Ozo throw Uyi ball away
'Ozo threw (Uyi's) ball away (*on him).'

This strongly suggests that animate IOs are originally merged into the same complement-of-V position as other kinds of goals. However, this parallelism is hidden on the surface by the fact that animate NP goals—and only they—subsequently move to a position before the theme object. This movement is presumably triggered by the NP's need for Case licensing, a factor that is not relevant to the other subspecies of goal (PP, AP, Prt, and even bare locative NPs, assuming that these are self-licensing , as in Larson's (1985) analysis of "bare NP adverbs" in English). There are many versions of exactly how this happens, and the details are not particularly relevant here. For concreteness, let us say (following an idea of Masanori Nakamura) that the IO adjoins to VP.[32] This means that it is no longer technically contained in the VP, and thus falls in the checking domain of the accusative-Case bearing element v. Therefore, it need move no further at LF:

(90) [NP_{ag} Voice [V_k [$_{VP}$ NP_i [$_{VP}$ NP_{th} t_k t_i]]]]

This seems like the simplest view consistent with the observable facts, in that it minimizes invisible functional categories and covert movements, although elaborations of the analysis are possible.

[32] An alternative might be to say that the IO moves into an outer specifier of VP, in the sense of Chomsky 1995:sec. 4.10. Note that either way the movement must count as an A-movement, in order to account for the Barss-Lasnik binding asymmetries in double object constructions.

Now, the crucial question is whether this second theory of the structure of double object constructions provides an explanation of the ungrammaticality of the examples in (83), which the "middle verb" analysis predicted to be possible. The answer is yes, once one makes the crucial observation that the second verb of a RSVC also acts as a goal-like delimiting expression with respect to the first verb. This is not too surprising since RSVCs with stative second verbs are very similar to AP resultative constructions (Baker and Stewart 1996).

(91) Òzó kòkó òmó mòsèmòsè/ mòsé.
Ozo raise child beautiful(A)/be.beautiful(V)
'Ozo raised the child (to be) beautiful.'

Similarly, RSVCs in which the second verb is a verb of directed motion are semantically very similar to constructions with goal PPs or particles; compare (33) with its English gloss, for an example. Furthermore, RSVCs are always telic aspectually, as shown by (92):

(92) *Òzó gbé èmá!tón guòghó là àwá ókpá.
Ozo beat metal break for hour one.
'Ozo beat the metal into pieces for one hour.'

Therefore, we expect the second verb of an RSVC to fall under the generalization in (87), so that it is in complementary distribution with PPs and other goal-like phrases. This is correct:

(93) a. *?Òzó fí àkhé yè òtíkù guòghó. *PP + V2
Ozo throw pot into trash break
'Ozo threw the pot into the trash so that it broke.'

b. * Òzó fí àkhé fuá guòghó. *Prt + V2
Ozo throw pot away break
'Ozo threw the pot away so that it broke.'

c. # Òzó gié Àdésúwà èkì kpàá *Loc NP + V2
Ozo send Adesuwa (to)market leave
'Ozo sent Adesuwa to the market away.'

d. * Òzó gbé èmá!tónpèrhè guòghó. *Resultative AP + V2
Ozo beat metal flat break
'Ozo beat the metal flat to pieces.'

The single delimiter constraint also explains Stewart's 1998 observation that RSVC formation cannot be iterated; rather, there can be at most one unaccusative verb following the transitive verb in an RSVC:

(94) *Òzó sùá òmó dé wú. (compare the well-formed RSVCs in (29)a and (55)b)
Ozo push child fall die
'Ozo pushed the child down dead.'

(In this respect, RSVCs differ from CSVCs, where the projection of the second verb does not function as a delimiter of the first verb, and iteration is therefore sometimes possible, as in examples like Òzó dé ìyán lé ré 'Ozo bought yams cooked ate' (Stewart 1998:101).) Now in the context of all these examples, the ungrammaticality of (83), repeated here as (95), follows immediately: it is another violation of the single delimiting complement constraint, this time with an animate goal and a verbal projection competing for the complement position. It is thus the expected completion of the paradigm spread out over examples (86), (89), (93), and (94).

(95) * Òzó gbé Úyì èmá!tón guòghó.
Ozo beat Uyi metal break
'Ozo beat the metal flat on/for Uyi.'

We conclude that the facts of SVCs in Edo support a movement analysis of IO-DO orders, rather than a base-generation analysis.

8. Final Remarks

The analysis just given has interesting implications for how the grammar interprets double-headed structures. To see this, compare the schematic structure of an RSVC in (96)a with the structure of a resultative PP construction in (96)b and with the structure of a CSVC in (96)c.

(96) a. NP ACT [v [$_{VP}$ NP V [$_{Vx}$ V (NP)]]]
b. NP ACT [v [$_{VP}$ NP V [$_{PP}$ P (NP)]]]
c. NP ACT [v [NP V] v [NP V]]

There is an interesting way in which the RSVC is the meeting point of two very different kinds of structures. On the one hand, the projection of the second verb (possibly including a complement of that verb, as in examples like (33)) merges with the first verb before that verb merges with its theme specifier. In this respect, the projection of the second verb counts as a complement of the first verb, just as the PP or particle does in (96)b. This captures the fact that the two kinds of phrases are interpreted in approximately the same way as goal-like delimiters of the first verb, and the fact that they are in complementary distribution with each other and with other phrases of the same class. That PP is technically a maximal projection and V^x is not is of little significance in a Bare Phrase Structure style system. The CSVC is not structurally parallel to resultative constructions in this respect, so it does not fall into this pattern.

On the other hand, (96)a is like (96)c and not like (96)b in that its VP can be taken to be a doubly headed structure, with the label of the category formed by merging the first verb with (the projection of) the second verb being calculated by intersection of features rather than by normal percolation. This captures a different set of parallelisms—including the fact that the RSVC and the CSVC are both impossible in the past perfective tense in Edo and they are impossible in any tense in English. In contrast, PP resultatives are compatible with past perfective in Edo and are found in English, because they have only one attractable V head.

Over all then, the second verb of an RSVC has a somewhat paradoxical behavior: it acts as the complement of the first verb in some respects and as its cohead in other respects. In fact, we can simply say that it is both things simultaneously, because it is a single configuration that happens to fit the basic structural definition of a complement and the basic definition of a double-headed construction. That such things should happen is not surprising if Merge simply

generates all kinds of structures rather freely, and the rest of the grammar is left to interpret them as best it can, by making use of a few general templates.

A somewhat similar paradox arises in CSVCs. In this construction, the two verbal phrases are co-heads and behave in symmetrical fashion for a range of syntactic tests—in particular, those involving extraction, c-command, and adverb licensing. However, the two verbal phrases are not interpreted in exactly the same way, as we have tentatively encoded in the COMBINE function from ordered pairs of events to composite events. In particular, the event characterized by the first VP must precede in time and enable the event characterized by the second VP. Also the first VP is treated by the grammar as parallel to the antecedent clause of a condition and the second to the consequent clause of a conditional, at least with respect to the dynamics of licensing *pro* (see section 6.2). As with RSVCs, the structural symmetry of the construction shows up clearly for syntactic purposes, but is broken to some degree by certain interpretive processes.

Overall, then, we have the following picture. Merge generates all kinds of structures freely. This can include double-headed constructions, the labels of which are the intersection of the features of the component parts when those features are similar enough. Such structures are often still-born, but they can survive when there is no higher head that attracts the head of the double-headed projection, and when other licensing conditions are satisfied. Since the clause has a highly articulated anatomy, there are a number of distinct joints at which a double-headed projection can be formed. Thus, a single analytic possibility gives rise to a whole family of syntactic structures, with predictably different properties. These are the various kinds of serial verb constructions in Edo and other West African languages. While the two verbal phrases in these structures typically show symmetrical behavior for syntactic phenomena in Edo, the interpretive component may break the symmetry in its effort to use the structures given to it by Merge in order to mean something.[33]

[33] We gratefully acknowledge the influence of Maria Bittner, and her Crosslinguistic Semantics program here, particularly her idea that semantics can add certain aspects of meaning to a syntactic structure to help the different pieces to fit together into a coherent interpretation (Bittner to appear). Crucially, those aspects of meaning that can be added are from a small and strictly universal vocabulary. How exactly to integrate the syntax we assume with a tightly constrained general system like hers to fully realize this vision must await further research, however.

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