**A Serial Verb Construction without Constructions**

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**Abstract:** This paper investigates the syntactic properties of Serial Verb Constructions (SVCs) consisting of two transitive verbs that seem to share a single direct object, as found in Edo, Nupe, and Yoruba. We claim these structures arise when one vP is adjoined to another vP and is predicated of it. This predication relationship is permitted if and only if the object of the second vP is a null pronominal linked to the object of the first vP, given the principles of predication that have been developed for relative clauses. This type of SVC contrasts systematically with two other kinds of SVC that are found in the same languages and look superficially similar: resultative SVCs, and purposive SVCs. We show that independently motivated principles permit these three types of SVC but no other variants. Thus, there is no need for construction-specific rules to define what types of SVC are possible and what are not.

**1. Why so many? Why so few?**

One of the strongest and most distinctive claims of Chomskian syntax for the last 25 years is that the notion of a syntactic construction has no theoretical status. Grammars of particular languages do not make positive statements of the form "such and such arrangement of categories is permitted." Rather, the idea has been that every kind of arrangement is in principle possible in every language, unless it happens to fail to satisfy some general filter or condition—as most arrangements do, in fact. Thus, the particular constructions that one observes in a given language are just those that manage to satisfy simultaneously the various requirements of the general grammatical conditions.

From this theoretical perspective, each new "construction" in the traditional descriptive sense that comes to light provides a new set of challenges. On the one hand, one must be able to show how this particular arrangement of syntactic elements satisfies all the known syntactic conditions. At the same

time, one must show how all the other imaginable arrangements of similar elements fail to satisfy at least one such condition, given that only a small percentage of the logically possibile arrangements are actually grammatical in any language. Only then can one be said to have explained why this particular construction exists in the language in question, and not some other.

It is in the context of this theoretical challenge that we wish to examine one particular kind of Serial Verb Constructions (SVC) that is found in certain Niger-Congo languages of West African, including Edo, Nupe, and Yoruba. A common descriptive characterization of SVCs is that they are clauses that have a single tense node, but two or more verbs, with no marker of coordination or subordination.[1] Recent work on SVCs has shown that there is actually more than one kind of construction that satisfies this general description. Some of the typologies that exist are based on intuitive semantic distinctions that are somewhat difficult to evaluate. However, Stewart [, 1998 #529] has shown clearly that there are several kinds of SVC that can be distinguished on syntactic grounds in the Edo language, and Stewart, Baker, and Kawu (2000) have replicated his distinctions for Nupe and Yoruba.

The particular type of SVC that we will focus on in this paper is the one that Stewart 1998 calls a Consequential Serial Verb Construction (CSVC). Simple examples of the CSVC in Edo and Nupe are:[2]

(1) a. Òzó ghá gbè ẹ̀wé khiẹ̀n. Edo
Ozo FUT hit goat sell
'Ozo will kill the goat and sell it.'

b. Musa du etsi kun. Nupe
Musa cook yam sell

[1][Schachter, 1974 #595] is an early and particularly clear expression of this intuition in generative terms; Baker [, 1989 #145] and Collins [, 1997 #589] are more recent versions, with some technological developments to handle object sharing. See Sebba [, 1987 #592] and Stewart [, 1998 #529:ch. 1] for histories of SVC research and overviews of how the topic has been delimited in the past.

[2] For both Edo and Nupe, we use standard orthographies (not phonetic transcriptions) and add markings of tone. (For the most part, we will not give Yoruba examples, for brevity.) The symbols ẹ and ọ in Edo indicate lax mid vowels within a seven-vowel system. The tonal properties of the two languages differ in a way that affects our transcription. Edo is a two-tone language with downstep, so we mark all vowels ´ for high or ` for low, and use ! between two syllables to mark downstep. Nupe is a three-tone language. Indications of high and low tone are the

'Musa cooked a yam and sold it.'

The most obvious distinguishing characteristic of the CSVC is that it consists of two transitive verbs, where the second verb has no overt object. Rather, the object of the first verb is understood as being the object of the second verb as well. Semantically, CSVCs describe composite events, which are made up of two distinct subevents that the agent performs in sequence as part of a single overall plan.

CSVCs need to be distinguished syntactically and semantically from two other types of SVCs that are found in these West African languages, which look superficially similar. On the one hand, CSVCs are different from what Stewart 1998 calls the Resultative SVC (RSVC), illustrated in (2).

(2) a. Òzó ghá gbè ẹ̀wé wù. Edo
Ozo FUT hit goat die
'Ozo will strike the goat dead.'

b. Musa tse èbi ta èsákò o. Nupe
Musa throw knife be.on table LOC
'Musa threw the knife onto the table.

In RSVCs, the second verb is an unaccusative verb (either eventive or stative), rather than a transitive verb. Semantically, RSVCs describe a single event, with the second verb characterizing a state that the theme argument comes to be in as a result of the action denoted by the first verb. CSVCs are also distinct from the construction in (3), for which we coin the name Purposive Serial Verb Construction (PSVC).

(3) a. Òzó ghá mi̱ẹn ìyán èvá lé. Edo
Ozo FUT find yam two cook
'Ozo will find two yams to cook (and do so).'

b. Musa wan nangi ya tsigbè. Nupe
Musa catch goat give medicine
'Musa caught a goat to give it medicine.'

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same as in Edo, and unmarked vowels are in mid tone. We have tried our best to get the tones right, especially for Edo where relevant grammatical properties are involved, but we will be surprised if we succeeded in every case.

PSVCs are like CSVCs in that they have a transitive second verb, the object of which is missing but is interpreted as the same as the object of the first verb. However, in PSVCs, the second verb is not always asserted, the way it is in a CSVC. Thus, (3b) in Nupe does not entail that Musa gave the goat medicine, whereas (1b) does entail that Musa sold the yams. (Edo is a bit different on this point; see below.)

Neither the RSVC nor the PSVC looks so strange from an English perspective. The RSVC is very much like English constructions with resultative APs and PPs like *Ozo shot the goat dead* or *Ozo beat the goat to death*. The only salient difference is the syntactic category of the resultative phrase (see, for example, [Larson, 1991 #239; Stewart, 1998 #529]). Similarly, PSVCs behave very much like those purposive constructions in English that contain an internal operator movement, such as *Ozo bought a book to read* [Williams, 1980 #238]. Thus, there are English-based theories that one can easily imagine extending to these West African constructions in a natural way. The CSVC is a bit harder to fit into this comfortable picture. That is why we concentrate on its distinctive properties here.

Seeking an attractively unified picture, most previous authors have analyzed CSVCs as in essence the same as either PSVCs [Carstens, 1988 #616; Larson, 1991 #239; Law, 1992 #612] Veenstra 1996) or RSVCs [Baker, 1989 #145; Collins, 1997 #589] (or both). However, careful investigation reveals that CSVCs have a cluster of distinctive properties that go beyond the transitivity and assertedness of the second verb. First, the second verb in a CSVC heads a vP, which contains a transitivizing light verb v in the sense of Chomsky [, 1995 #465], but no higher functional category. Second, the theme theta role of the second verb in a CSVC is discharged to a null pronominal object, not directly to the object of the first verb, nor to the trace of an operator. Third, the second vP in a CSVC is adjoined to the extended projection of the first verb in a low position; it is not a complement of the first verb, nor is it adjoined in a relatively high position. This cluster of properties is summarized and contrasted to the properties of RSVCs and PSVCs in the following table:

(4)

| Type | *Size of VP2* | *Object of VP2* | *Attachment site* | *NP analog* |
|---|---|---|---|---|

| | | | | |
|---|---|---|---|---|
| *CSVC* | vP | pro | Adjoined to vP1 | Participial relative |
| *R SVC* | VP | None | Complement of V1 | (Attrib. Modification) |
| *P SVC* | AspP | wh-trace | Adjoined to AspP1 | Operator relative |

The data that shows that CSVCs differ systematically from neighboring constructions in these respects will be presented in the body of this paper. In particular, after some preliminaries about clause structure, headedness, and tense inflection in section 2, we present the evidence that the second verb heads (only) a vP in section 3. Section 4 looks at the empty category that serves as the direct object of the second verb in a CSVC, investigating its pronominal nature, and why it must be present (in contrast to RSVCs). Section 5 considers why the second verb phrase is an adjunct in CSVCs, whereas it is a complement in RSVCs. Section 6 returns to the object of the second verb, to consider why it must be an empty category that is linked to the object of the first verb. Finally, in an appendix to the paper, we take up the question of why the second verb phrase of a CSVC adjoins to a different phrase than the second verb phrase of a PSVC. Throughout the discussion, we will be concerned with how the CSVC satisfies the various boundary conditions on syntactic structure that are imposed by Universal Grammar.

However, there is another, equally important task to attend to. Although at this point the reader might be impressed with how many different kinds of SVC there are, it is equally striking how few kinds of SVC there are, as compared to the total space of logical possibilities. There are (at least) three amounts of structure that the second verb phrase can have, three levels at which the second verb phrase can be attached, and three ways of discharging the second verb's theme theta-role. Thus, a priori we might expect 3x3x3=27 different kinds of SVCs, if all these choices were independent. But there are not 27 different kinds of SVCs in these languages; there are only the three kinds described above and summarized in (4).[3]. Thus, only 11% of the logically possible constructions are actually attested in these languages. Therefore, the other question that must be faced by a construction-free theory—or any theory

[3] We do not mean to deny that there might be other kinds of SVCs beyond the three we are discussing in these languages. On the contrary, we have some inklings that there are, including perhaps the special instrumental serials discussed in many references, and certain SVCs that have a pleonastic verb meaning something like 'take' as the

interested in deepening explanation—is why are these the only possibilities? How do general principles permit the CSVC, but not the other conceivable combinations of these properties?

Indeed, in order to approach the construction-free ideal, we must do even a bit more. We must also show that the principles that determine the properties of the CSVC are independently motivated, in the sense that they also play a role in determining the properties of other, phenomenologically quite different syntactic structures. Otherwise, they are not general principles at all; rather, we would have merely replaced the terminology of construction-specific rules with the terminology of construction-specific principles. To accomplish this, we will draw an analytical link between the three kinds of SVCs and three distinct ways that a noun can be modified in English and other languages, as indicated in the last column of table (4). In English, purposive constructions that involve null operator movement are partially similar to relative clauses such as *[the pot [OP that Ozo bought t]]*; they fall under some of the same priniciples of A-bar movement and predication [Chomsky, 1977 #26; Williams, 1980 #238]. PSVCs can be analyzed in essentially the same way. On the other hand, resultative APs in English can be compared to attributive AP modifiers in NPs such as *[the [big pot]]*: in both cases an A(P) is merged directly into the structure, without the mediation of an empty category [Baker, to appear #652]. It is natural to see RSVCs as a variant of this construction (supplemented with principles of complex predicate formation by incorporation, as we shall see). Now where could the CSVC fit into this comparison? Our basic thesis is that CSVCs are the verbal equivalent of a third major way that NPs can be modified in English: namely, by control of a pronominal empty category, as in participial relative clauses like *[the pot [PRO sitting on the table]]*. In theoretical terms, this will amount to explaining the cluster of properties associated with CSVCs in terms of the principles from the theory of predication proposed in Williams 1980 and subsequent work. Our claim is that once a language allows two verbs to be in a single clause, the CSVC emerges more or less automatically alongside the other types of SVC, as one possible solution to the same constraints of Universal Grammar that shape NP modification and other forms of predication.

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verb1. However, these additional kinds of SVCs are not defined by the three factors we are discussing here, but would fall outside the space of possibilities we are considering.

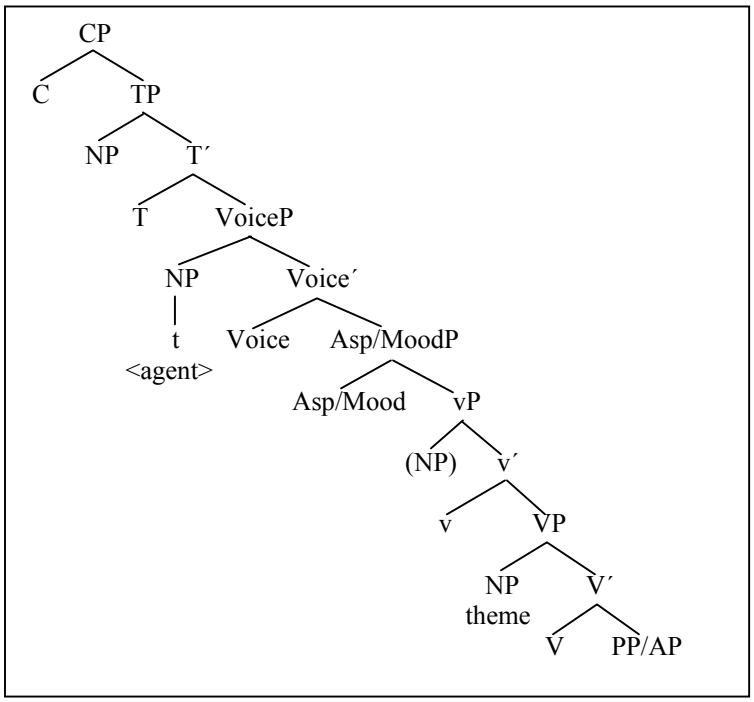
## 2. Preliminaries of Clause Structure and SVC Licensing

Before beginning our main task in earnest, we need to present the view of clause structure that we will be assuming. With this in hand, we can show more accurately the structure of the CSVCs that we will be arguing for and trying to explicate. We will also present some evidence that the first verb is the head of the clause in the CSVC, and give some informal remarks about why many West African languages allow SVCs whereas most Indo-European languages do not. Once these preliminaries are taken care of, we will be in a better position to pose the central questions of interest and to answer them.

### 2.1 The sequence of heads in a clause.

The structure of the clause that we assume in this paper is given in (5).

(5)




This rather highly articulated structure is a synthesis of a variety of proposals that have been made in recent years. The C(omplementizer) and T(ense) nodes are familiar, and need no explication (they are not central to the discussion anyway). The claim that there is some kind of Aspect (or Mood) phrase below TP but higher than VP is also relatively uncontroversial (see Travis 1991, Cinque 1999, and others).

The idea that the agent theta role is assigned by a distinct head that is below the surface position of a subject in Spec, TP, but higher than the smallest projection of the true verb is also familiar from Kratzer [, 1996 #510] and Chomsky [, 1995 #465]. However, both Chomsky and Kratzer assume that the head that assigns an agent theta role and the head that licenses a transitive verb form and checks the Case of the direct object are the same head, which Kratzer calls Voice and Chomsky calls v. In this way, they build Burzio's Generalization explicitly into their theory, which says that accusative case is present in a clause if and only if a subject theta role is assigned. However, there are plenty of well-attested counterexamples to Burzio's Generalization, and other, better ways of accounting for it where it is true. For example, transitive verb forms can appear with accusative objects but with no sign of a subject in causative constructions in many languages (e.g., French *Jean a fait manger la torte* 'John made [eat the cake]' [Burzio, 1986 #131]). Similarly, many languages have passive constructions in which the agent theta role is suppressed but the object is still assigned accusative Case, including Ukrainian [Sobin, 1985 #657] and Zuni (Lynn Nichols, personal communication). Thus, we depart from Kratzer and Chomksy on this point. We claim that the Agent theta role is assigned by Voice, whereas transitive verb forms and accusative case are checked by a distinct lower head v.

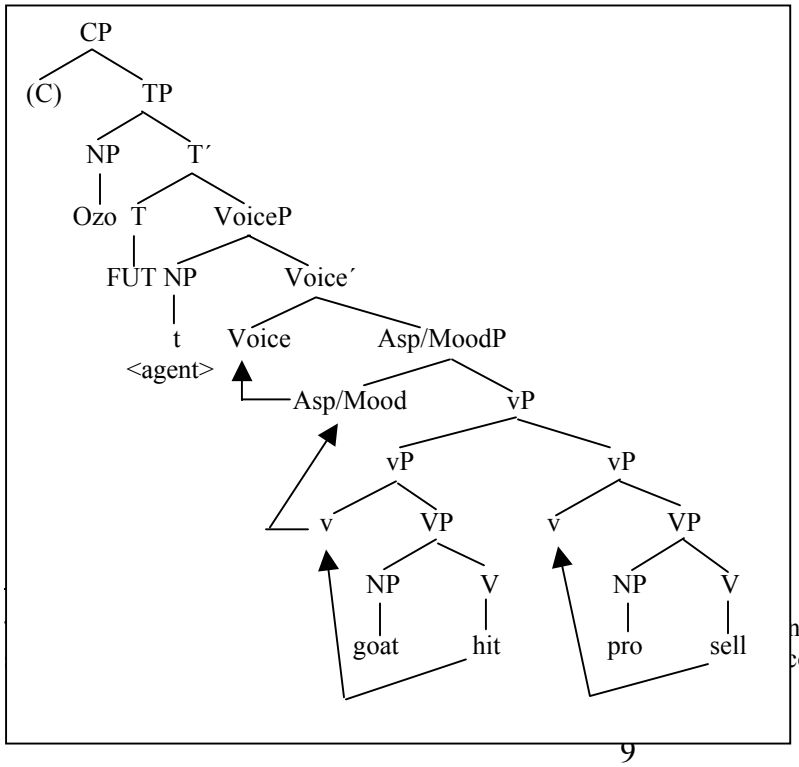
The other feature of (5) that is not standard is the placement of an Aspect/Mood node below the base position of the subject. Motivation for such a position can be found in Travis [, 1991 #141], among others. The theme argument is theta-marked in the specifier of VP, the lowest phrase of the clausal spine, and goal-denoting PPs and resultative APs are complemenents of this V, as has been standard in Chomskyan theory since Larson [, 1988 #140] (see also [Hale, 1993 #363]). When this entire structure is present, the V generally moves at least to v to form a transitive verb root; it often moves as far as Voice, and sometimes moves on to T (in French-type languages as opposed to English-type languages). However, not all of this structure need be present. In particular, we assume that typical unaccusative structures in which the sole NP argument of the verb is a theme can lack both the vP level and the VoiceP level. Then the theme NP inside VP may and often must move directly to Spec, TP for Case-checking.

This view of clause structure has some pleasing symmetries. The six heads divide up into two subgroups: the lower three are concerned with the object, and the higher three are concerned with the subject. In both domains, the lowest specifier is a theta position, and the intermediate specifier is a Case checking position. The highest potential specifier in each domain is not involved in argument licensing at all. Rather, the specifier of CP is an A-bar position, a possible target for operator movement. We will claim that the same is true of the specifier of AspP/MoodP, at the top of the object layer.[4]

Of course, there may in fact be even more to the structure of the clause than this. For example, perhaps what we call T should actually be decomposed into several heads, and perhaps there are other Aspect heads generated in other places in the tree, as in Cinque [, 1999 #554]. The structure also may need to be elaborated to accommodate double object constructions, a matter we touch on only briefly in section 6. For the most part, we leave these matters open. However, it is important that ordinary transitive clauses have *at least* the structure given in (5), for reasons that will will become clear as we go.

Given the basic structure in (5), we can now propose more complete structures for each of the types of SVCs described informally in section 1. The CSVC, which is our primary concern, we claim to have the structure in (6).

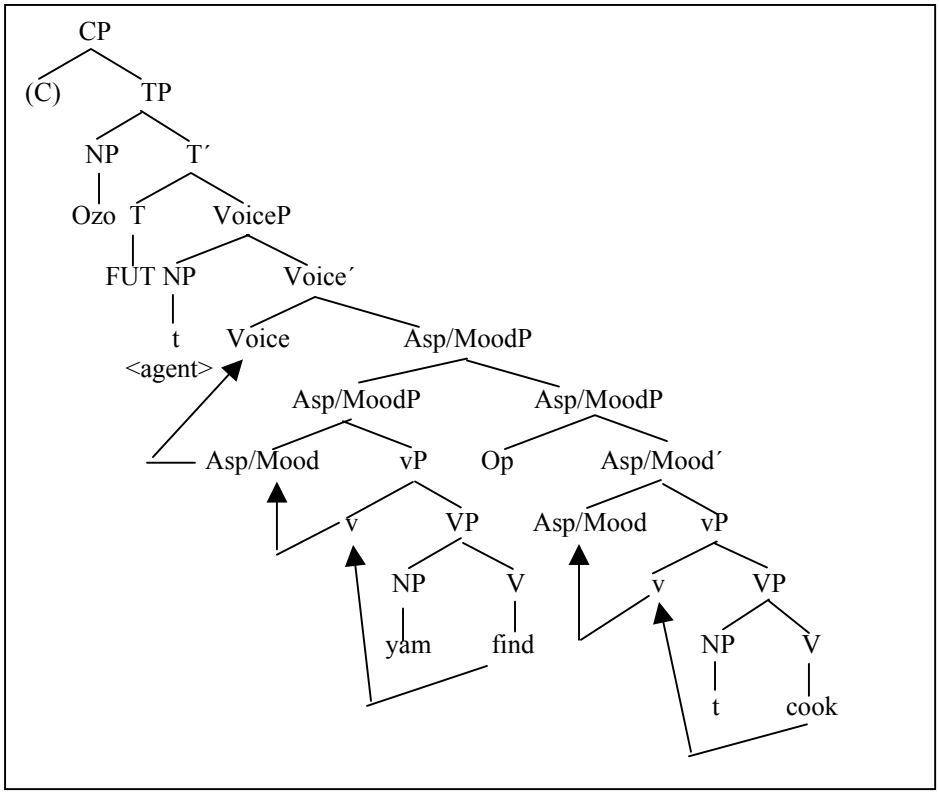
(6) CSVC



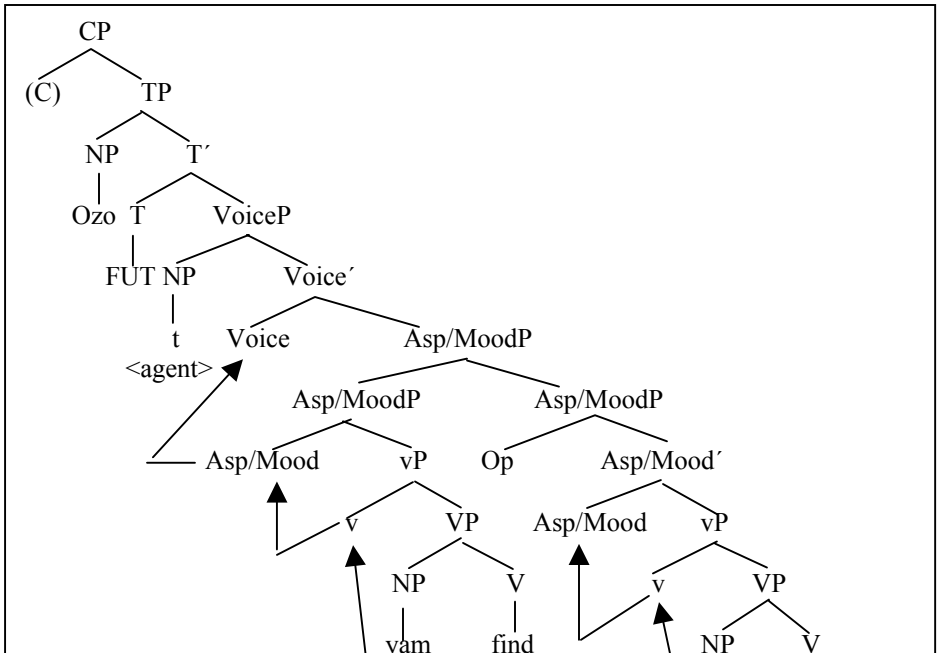

h a VP-internal A-bar specifier in French
coins'.

Note in particular that (6) has a second vP adjoined to the first vP, and the theme of the second verb is assigned to *pro*. In contrast, RSVCs have the structure in (7), and PSVCs have the structure in (8).

(7) RSVC




(8) PSVC



Note that in the RSVC in (7) the second verb heads a VP that is the complement of the first verb and that contains no NP theme at all. On the other hand, in the PSVC in (8), the second verb phrase contains not only a v but also an Aspect/Mood projection, the specifier of which hosts a null operator. This additional Asp head may itself be phonologically null (as in Nupe) or realized only as a floating high tone on the verb stem (as in Edo). The second AspP is adjoined to the main AspP, rather than to the vP as in (6). (6), then, is the structure that we seek to motivate and derive, in contrast to (7) and (8). (Whether V1 moves beyond v to Voice in these structures is not crucial, but is included for illustrative purposes.)

Since the traditional category "verb" is decomposed into at least three distinct syntactic pieces in this framework, we need to be very careful about terminology. Therefore, in the paper we will *not* use "V" as an abbreviation for the ordinary word "verb". Rather, we will use "verb" to mean any kind of lexicalized verbal structure—a verb in the traditional, non-theoretical sense. Similarly, we will use verbP to mean a phrase containing a lexicalized verb; this terminology is intended to be neutral as to whether the phrase in question is technically a VP, a vP, an AspP, or a VoiceP. All types of SVCs have two verbPs in this sense. The symbols v, V, vP, and VP will only be used to name official heads and phrases in the structures shown above. Finally, to any of these symbols we will append a number 1 or 2, depending on whether we are referring to the first such phrase in an SVC or the second one. Expressions like "verbP2" (for second phrase containing a lexical verb root) look a bit clumsy, but we hope they will be clear.

2.2 The headedness of CSVCs.

One important feature that the CSVC structure in (6) has in common with the other types of SVCs is that the verb1 is the ultimate head of the extended projection that constitutes the clause. As a result, if any verb in the CSVC is going to move into higher head positions, it will be the verb1. That there is such a structural asymmetry is not as obvious in CSVCs as it is in RSVCs and PSVCs, because the two verbPs of a CSVC are interpreted conjunctively. For example, 'Ozo cook food sell' means approximately 'Ozo

cooked the food and sold it'. Partly for this reason, in earlier work we assumed that both verbs in an SVC are coheads of a single verbP [Baker, 1989 #145; Baker, 1999 #656; Baker, 1998 #590]. However, the notion that a single phrase can have two heads has been seen as theoretically problematic. Most theories of phrase structure rule this possibility out out of hand [Kayne, 1995 #262; Chomsky, 1995 #465], and there are embarrassingly few clear candidates for a doubly headed structure. It also turns out that there are some subtle syntactic asymmetries between the verb1 and the verb2 of a CSVC that fall into place if the verb1 is analyzed as the only syntactic head of the clause.

The emprical evidence that we have in mind comes from an unusual verb doubling construction found in Nupe [Cormack, 1994 #661; George, 1975 #660], but not in Edo or Yoruba. This verb doubling has the semantic effect of giving emphasis to the verb of the clause. Structurally, one copy of the verb appears after the tense particle and VP-initial adverbs, but before any objects. The second copy of the verb appears after any objects, but before VP-final adverbs, PPs, and extraposed CPs, as shown in (9).

(9) a. Musa le le kata o. Nupe
Musa sleep sleep house LOC
'Musa actually slept in the house.'

b. Musa à du etsi du sanyin.
Musa FUT cook yam cook quietly
'Musa will actually cook the yam quietly.'

What is the syntax of these examples? The first copy of the verb is unproblematic: it appears precisely where any normal verb appears on the surface in Nupe. The position of the second verb is more interesting: it is neither at the beginning nor at the end of what would normally be considered the verb phrase. It is, however, in exactly the position where one would expect the verb to originate in the Neo-Larsonian structure in (5): after the direct object in Spec, VP, but before all PPs and adjuncts to VP. Thus, the natural analysis of this construction in Minimalist terms is to say that the "Copy" part of movement applies to the verb root as usual, creating a token of the verb root in a relatively high head

position (say Voice). However, in these examples the "Delete" component of Movement fails to apply. As a result, a second copy of the verb root surfaces in the lowest head position, inside VP.

If this analysis is on the right track, then the Nupe verb-doubling construction gives us an unusual opportunity to observe both the head and the tail of a head-movement chain at the same time. We can apply this to the CSVCs, where there is some question which of the two verbs (if either) is the syntactic head. Suppose then that we try to do emphatic verb doubling in a clause that contains a CSVC. The verb that can be doubled is (by hypothesis) the verb that moves to higher head positions, and this must be the head of the construction, given the nature of $X^o$-movement. When this test is applied to the CSVC in Nupe, we get a clear and unambiguous result: only the first verb can be doubled.

(10) a. Musa du etsi du kun. (compare (1b))
Musa cook yam cook sell
'Musa actually cooked the yam and sold it.'

b. *Musa kun etsi du kun
Musa sell yam cook sell
'Musa cooked the yam and actually sold it.'

(10b) is ungrammatical regardless of where the copy of the verb2 appears with respect to the object; for example, **Musa du etsi kun kun* 'Musa buy yam sell sell' is also bad. This confirms that the verb1 is the head of the CSVC and the $X^o$ that is capable of raising to higher head positions.[5] (This verb doubling test also shows that the verb1 is the head in RSVCs and PSVCs in Nupe, as expected.)

This conclusion is important, because it shows that we need not worry about how the verbP1 in a CSVC is licensed. It is licensed in exactly the way that the main verb phrase of any ordinary matrix

[5] A similar point could be made in Norwegian, if the construction described by [Afarli, 1987 #663] turns out to be the same as the CSVC in Nigerian langauges, as it seems. In Norwegian, it is clearly the first verb of the CSVC-like construction that acts like the head in undergoing movement to second position of the clause, not the second verb.

Another asymmetry between the verb1 and the verb2 of a SVC is that only the verb1 can be focused in so-called Predicate Cleft constructions in Nupe and Yoruba. For Nupe, these predicate clefts might be derived from an emphatic verb doubling structure by wh-moving the second copy of the verb.

clause is. Rather, it is the verbP2 that requires special discussion, to see how it is licensed with respect to the verbP1. Thus, we (continue to) take verbP1 for granted and focus our attention on verbP2.

2.3 Inflectional preconditions for having SVCs.

As a final preliminary, it behooves us to say something about why CSVCs are (like the RSVC) typologically restricted, being found only in the West African languages and a few other linguistic areas, but not in English and most other Indo-European languages. Many people have made similar proposals about this (including us in previous work), and we do not have much to add to the topic here. While important questions remain about the details of these accounts, we believe that the proposals are generally on the right track, and we do not want to get bogged down on the matter here. Thus, for current purposes we merely sketch in very general terms what kind of theory seems to be called for.

A rough typological generalization that has been noticed by many linguists who have taken up this question is that most types of SVCs seem to exist only in languages with little or no verbal inflection. Nupe is fairly typical of the serializing West African languages in that it has no inflectional affixes that attach to verbs; what tenses it has are all expressed by preverbal particles, including *à* 'future', *è* progressive, *fé è* past progressive, etc. In this respect, Nupe differs from "Standard Average European" languages in which verbs typically bear some kind of tense and agreement morphology. The other areas of the world where similar-looking SVCs are known to exist are the Caribbean and Southeast Asia, including languages like Thai, Khmer and Vietnamese [Schiller, 1990 #329]. These languages also have little or no verbal inflection [Schiller, 1988 #598]. Within the Kwa languages of Nigeria, Igbo is special in that it has relatively rich verbal morphology, with every verb bearing an inflectional suffix. Igbo is also special in not having SVCs on the surface [Déchaine, 1993 #362].[6] These facts suggest that the parameter that makes SVCs possible has something to do with the relationship between tense and the verb. In particular, serializing languages must somehow loosen the biunique relationship between T nodes and verbs that generally holds for European languages.

We can offer two new confirmations that this idea is on the right track, based on our material. The first involves comparing PSVCs to the other types of SVC. Language-internal evidence shows that PSVCs have a T-like node (Asp/Mood) in Edo and Nupe, whereas the other kinds of SVC do not. This fits nicely with the comparative evidence that English has a construction that is essentially identical to the PSVC, in the form of examples like *Chris bought a book to read*. However, English does not have the other kinds of SVC. This is what we would expect if English needs all verbs to be biuniquely matched with a tense/aspect/mood node, but Nupe, Yoruba, and Edo do not.

The second confirmation that this idea is on the right track comes from some details of Edo. Unlike Nupe and Yoruba, Edo does have one tense marker that is realized as a segmental suffix: the past perfective tense, which consists of /r/ plus a harmonizing vowel. Strikingly, this one tense is incompatible with both RSVCs and CSVCs in Edo:[7]

(11) a. *Àkhé ò́ré Òzó suá-rè dé(-rè). RSVC
pot FOC Ozo push-RV fall(-RV)
'It's the pot that Ozo has pushed down.'

b. *Èvbàré ò́ré Òzó lé-rè khié́n(-rè̩n). CSVC
food FOC Ozo cook-RV sell(-RV)
'It's food that Ozo has truly cooked and sold.'

Note that these examples are bad whether or not the –rV suffix shows up on the verb2 as well as on the verb1. The past perfective tense is, however, compatible with PSVCs:

(12) Àlìmói ò́ré íràn mié́n-rè̩n kpá!án. PSVC
Orange FOC they find-RV pluck
'It's an orange that they have found to pluck.'

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[6] Igbo does seem to have RSVCs underlyingly, but these necessarily get transformed into V-V compounds by verb incorporation [Ihionu, 1992 #586]. We return to this briefly below in section 4.

[7] If the verb has a direct object, it must be clefted in this tense; see Baker and Stewart [, 1998 #590] for discussion.

Thus, in the one subarea of Edo in which verbs are like European verbs in bearing tense inflections, we find the same limited range of SVCs that European languages allow. This is an elegant language-internal demonstration that the tense-verb relationship is crucial to whether SVCs are generable or not.

In order to account for this range of data, we need principles with roughly the following effects. First, the following two principles would hold in both types of language under consideration:[8]

(13) The two verbs of an RSVC and a CSVC must match morphologically.

(14) Each tense node has a unique morphological realization in the clause.

The ungrammaticality of the examples in (11) without an –rV affix on the second verb illustrates (13); the ungrammaticality of the examples with the –rV affix on the second verb illustrates (14). Now (15) is a parameter. It holds in most European languages and constructions, in Igbo, and in many other languages; however, it does not hold in Edo, Nupe, Yoruba, Caribbean Creoles, or the South East Asian languages:

(15) Verbs must be inflected for tense and finiteness.

If an RSVC or CSVC construction is generated in a language with (15), there is an unresolvable conflict between (13) and (14). This conflict makes SVCs impossible in such languages. SVCs are also impossible in Edo past perfective sentences, where verbs idiosyncratically happen to be inflected. However, in languages in which (15) does not hold, Tense can show up as a separate particle (if at all). This particle will be its unique realization, and the two verbs of an SVC match in their bare, uninflected forms. This is what we find for CSVCs (and RSVCs) in Edo, Nupe, and Yoruba. PSVCs are possible regardless of (15), because each verb is unique related to a distinct tense/aspect node.

This then is the sort of theory that seems to be called for, and we assume it as background for this paper. We leave open exactly how the theories of morphology and syntax should be developed to

[8] Edo marks one-syllable past tense verbs with high tone, and nonpast verbs with low tone, but this tonal marking for tense does *not* count as a "morphological realization" for (14). These tone values do spread onto both verbs of an SVC. Note also that (13) as stated is a construction specific principle, and hence a departure from our construction-free ideals. Presumably, it is a special case of the more general principle that also requires the heads of conjoined phrases to match in inflection. However, we will not pursue the matter here.

implement these principles. We also leave open whether or not these are the only factors involved in permitting and excluding SVCs in languages of the world.[9]

**3. The Size of the verbP2**

With this as background, we can now turn to the first part of our topic proper: the claim that the verbP2 in a CSVC is a vP, as opposed to a VP or an AspP.

The empirical evidence for this is relatively straightforward, given our assumptions. The claim that verbP2 is at least a vP rests primarily on the fact that the second verb is transitive. CSVCs differ in this respect from RSVCs, in which the verb2 is a stative or eventive unaccusative verb (a verb like 'be-short', 'be-tight', 'be-beautiful', 'fall', 'break', 'die', or 'go'). Given that transitive verb roots are licensed by a v appearing in conjunction with a V node in our theory, it follows that there must be a v projection associated with the verbP2 as well as one associated with the verbP1 in the CSVC.

Further confirmation for this comes from the distribution of certain adverbs in Edo. These adverbs come after an overt tense particle, but before the surface position of a transitive verb:

(16) a. Ì ghá gié!gié guó!ghó àkhé.
I FUT quickly break pot.

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[9] Probably these are not the only factors. For example, some languages might reconcile (13) and (15) by weakening (14). Thus, it is said that inflected verbs in Akan can enter into SVCs so long as the two verbs match (Schachter, 1974). See also [Afarli, 1987 #663] for a CSVC-like construction in Norwegian that falls under this description.

Also, some factors beyond verb inflection might be required for a language to realize a full range of SVCs. English verbs are not inflected when they are in the imperative or under a modal auxiliary. In these contexts (only), American English allows the SVC-like construction in (i) (see [Jaeggli, 1993 #511], among others).

(i) a. Come see me tomorrow.
b. Chris will come see me tomorrow.
c. *Chris comes see(s) me every Thursday.
d. *Chris came see/saw me yesterday.

This looks like another instance of the conflict between (13) and (14). Nevertheless, full-fledged RSVCs and CSVCs are not found in English, even in the imperative:

(ii) a. *Cook the food eat by the time I get home!
b. *Polish the table shine!

This suggests that allowing uninflected verbs is a necessary condition for having these types of SVC (in languages that obey (14)), but it may not be sufficient. (The fact that English never permits direct object *pro* might also be

'I will quickly break the pot.'

b. *Ì gié!gié ghá guòghó àkhé.

I quickly FUT break pot.

c. *Ì ghá guòghó gié!gié àkhé.

I FUT break quickly pot.

Thus, they must be licensed in a position that is lower than T but higher than v. Significantly, these adverbs can also appear before the verb2 in a CSVC:

(17) Òzó vbó òkhókhò ìgàn giégié khién.

Ozo pluck chicken feathers quickly sell

'Ozo plucked the chicken of feathers and quickly sold them.'

In contrast, Stewart 1998 shows that these adverbs cannot come before the verb2 of an RSVC:

(18) *Òzó fĩ àkhé gièégié guòghó.

Ozo throw pot quickly break

'Ozo threw the pot so that it quickly broke.'

This contrast follows from our structures if we assume that this type of adverb left-adjoins to vP specifically. Since there is such a node within the verbP2 of CSVCs but not within the verbP2 of RSVCs, (17) is possible but (18) is not.

Next, consider the evidence that the verbP2 in a CSVC is no more than a vP, contrasting in this respect with PSVCs. We have already seen some evidence for this distinction above. First, there is the semantic fact that in Nupe the content of the verbP2 in a CSVC is asserted, whereas the verbP2 in a PSVC is not asserted. This is consistent with the claim that there is an irrealis mood head that has scope over verbP2 in a Nupe PSVC, but not in a CSVC. This semantic contrast is not detectable in Edo, where the verbP2 counts as asserted even in the PSVC. However, there is morphophonological evidence in Edo that points to the same conclusion, stemming from the fact that tense is expressed as tonal distinctions on

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relevant to the ungrammaticality of (iia), for example. Similarly, English's preference for adjectives rather than intransitive stative verbs might be relevant to the ungrammaticality of (iib).)

the verb in Edo. In CSVCs, two monosyllabic verbs always match for tone: they are both high, indicating past tense, or both low, indicating nonpast tense. In contrast, the tone of the verb2 of a PSVC is invariably high, regardles of the tone of the verb1. The contrast can be seen in (19).[10]

(19) a. Òzó ghá gbè ẹ̀wé **khiẹ̀n.** CSVC

Ozo FUT hit goat sell

'Ozo will kill the goat and sell it.'

b. Òzó ghá miẹ̀n ìyán èvá **lé.** PSVC

Ozo FUT find yam two cook

'Ozo will find two yams to cook (and do so)."

This pattern makes sense if there is a Mood/Aspect head (which seems to be semantically realis in Edo) that dominates the second vP and assigns high tone to the verb2 in (19b), regardless of the the matrix Tense. In contrast, the verbP2 of a CSVC contains no tone-determining functional head. As a result, the tone determined by the matrix Tense is realized on the verb2 as well. Thus, we conclude that the verbP2 of a CSVC is no less than a vP, and no more.

Why is it it possible to have a second vP inside a clause in Edo, Nupe, or Yoruba? So far, nothing additional needs to be said about this beyond the typological remarks given in section 2.3. Merge is a basic syntactic operation that functions freely to build phrase structures of all kinds. If the right elements are selected from the lexicon—say two distinct Vs and two distinct vs but only a single Aspect, Voice, and Tense—then a structure with two vPs can be built. In some languages, such a structure will result in a crash, because lexical verbs cannot be matched with corresponding functional heads in a biunique way. However, there is generally no such matching requirement in Edo, Nupe, and Yoruba. Hence, the possibility of having a second vP in the structure arises automatically from the free operation

[10] We transcribe the tone on a one-syllable verb after the future marker *ghá* as low, following Agheyisi [, 1990 #381] and other standard sources. In fact, something more complex may be happening here tonologically, but we are not sure what. In any case, the tonal contrast on the verb2 in the examples in (19) is clear, and that is what is crucial for our purposes.

of Merge in these languages. The challenge is to explain the syntactic ramifications of having such a structure—why it goes along with a particular kind of empty category and a particular adjunction site.

**4. The object of verbP2 (1): its presence and nature**

Perhaps the most theoretically significant property of CSVCs is the fact that the object of the verb2 must be a *pro* coreferent with the object of the verb1. This is a very unusual restriction, which is not immediately familiar from other constructions. Our discussion of the matter will be divided into several phases. In this section, we begin the task by arguing that the object of verb2 is *pro*, rather than some other empty category, and by explaining why some kind of object is needed in verb2 in CSVCs (and PSVCs) but not in RSVCs. Then, after a brief discussion of phrase structure implications in section 5, we return to other aspects of the null object in section 6.

4.1. The object of verbP2 is *pro*.

Some of the best evidence that the object of verb2 is a *pro* only in CSVCs comes from the distribution of a reflexive-like element *tobọre* 'by him/her/itself' in Edo (plural form: *tobiran* 'by themselves'). This *Tobọre* has no correspondent in Nupe or Yoruba, so far as we can tell. Its distribution is somewhat complex. In addition to uses as a subject-oriented adverb or a depictive secondary predicate in VP-final positions (which we put aside), *tobọre* can be adjoined to the right of an NP in any syntactic position within the clause. (20a) shows it adjoined to the subject; (20b) shows it adjoined to the direct object.

(20) a. Òzó tòbórè ghá lè èvbàré.
Ozo by.self FUT cook food.
'Ozo by himself will quickly cook the food.'

b. Òzó kpàán àlìmói tòbórè.
Ozo pluck orange by-itself
'Ozo plucked the orange by itself.'

*Tobọre* can also appear "floated" off of the subject NP, between the tense head and the verb:

(21) Òzó ghá tòbórè lè èvbàré.

Ozo FUT by.self cook food

'Ozo will cook the food by himself.'

*Tobọre* can even appear between a control verb and its infinitival complement, after the nonfinite T head *ya* (see Stewart [, 1999 #664] for detailed discussion of these constructions).

(22) 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 *tous* in French and *all* in English, as studied by Sportiche [, 1988 #600]. Sportiche argues that such floated elements are also adjoined to a subject DP, just as in (20a). In (22), the subject host is a null PRO, controlled by the matrix subject. In examples like (21), the floated element is adjoined to a subject position generated inside the verbP prior to raising to the Spec, TP position; for us, this position is the specifier of VoiceP. Thus, *tobọre* (like *tous* and *all*) has the useful property of marking certain kinds of phonologically null argument positions. An exception is that *tobọre* cannot be adjoined to a *wh*-trace, as shown in (23):

(23) *Àlìmói ọ̀ré Òzó kpá!án -- tòbọ́rè. (compare (20b))

Orange FOC Ozo pluck by-itself

'It's an orange that Ozo plucked by itself.'

In this respect, too, *tobọre* is comparable to English *all*, given the ungrammaticality of sentences like *It's the children that I saw all.*[11]

Unlike its French and English counterparts, *tobọre* seems to be able even to adjoin to NP-traces in object positions. Once one controls for adverbial uses of *tobọre*, a difference between unaccusative verbs and unergative verbs in Edo emerges: NP-adjoined *tobọre* can follow unaccusatives, but not unergatives.

(24) a. Úyì dé tòbọ́rè.

Uyi fall by.self

[11] In contrast, French *tous* can be stranded by *wh*-movement, according to Sportiche 1988.

'Uyi fell by himself.'

b. #Úyì só tòbórè.

Uyi shout by.self

'Uyi shouted by himself.'

The contrast follows because there is a trace bound by the surface subject following the verb in (24a), to which *tobore* can adjoin, but there is no such trace in (24b). (Here we crucially assume that except in the past perfective tense verbs raise no higher than Voice in Edo; see Baker and Stewart 1998.)

Now, consider what happens when *tobore* is added to SVCs. As expected, *tobore* can be adjoined to the overt object that follows the verb1 in all types of SVC. Stewart 1998:67-68 observes that *tobore* can also follow the verb2 in the CSVC, and still be interpreted as modifying the "shared object":

(25) Òzó dé ìyán$_k$ dùnmwún -- tòbórè$_k$

Ozo buy yam pound by.self

'Ozo bought the yam and pounded it by itself.'

In contrast, object-oriented *tobore* cannot follow the second verb in a RSVC:

(26) *Òzó sùá ògó$_k$ dé (--) tòbórè$_k$

Ozo push bottle fall -- by.self

'Ozo pushed the bottle down by itself.'

(26) contrasts minimally with the simple unaccusative structure in (24a), in which the same second verb appears outside of a RSVC. These facts show that there is an empty NP in the projection of the second verb in the CSVC which *tobore* can adjoin to, but there is no such empty category in the RSVC.[12] Object-oriented *tobore* also cannot appear following the second verb of a PSVC:

[12] In this we disagree both with references like Collins 1997, who holds that an empty category is present in all kinds of SVCs, and with references like Baker 1989, who holds that there is no empty category in any SVC. More precisely, the examples in the text show that there is no empty category *after the second verb*. It is still conceivable that there is an empty category before the verb2, in the specifier of VP2 as shown in (i).

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

(27) Òzó mi<u>é</u>n àlìmói kpá!án -- (*tòb<u>ó</u>rè).

Ozo find orange pluck by-itself

'Ozo found an orange to pluck by itself.'

This is consistent with the claim that the gap following the verb2 is a *wh*-trace in the PSVC; then (27) is ruled out parallel to (23). In contrast, the grammaticality of (25) indicates both that the verb2 of a CSVC is followed by an empty category (vs. Baker 1989), and that the empty category is not a wh-trace (vs. Carstens 1988, Larson 1991, Law and Veneestra 1992, and perhaps Campbell 1996).

More subtle evidence for this conclusion comes from the interpretation of sentences that contain a quantified direct object sandwiched between the two verbs of an SVC. The following Edo examples differ in their interpretation in an interesting way:

(28) Òzó sùá èrhán khérhé dè-lé. RSVC

Ozo push tree few fall-PL

'Ozo pushed (a) few trees down.'

(29) Òzó d<u>é</u> èbé khéhré tié. CSVC

Ozo buy book little read

'Ozo bought (a) few books and read them.'

The RSVC in (28) has a simple conjunctive reading: it means that there are few trees such that Ozo pushed them and they fell. It is true of a situation in which Ozo pushes many trees, but most of them stay upright; it is also true of a situation in which many trees fall, but most of them do so as the result of an earthquake. However, the CSVC in (29) is different: it implies that Ozo bought only a few books in total, and that he read all of the books that he bought. This sentence is judged to be false of a situation in which

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(This is the structure that Collins 1997 assumes for this type of SVC.) This structure predicts that *tob<u>o</u>re* can follow the object in an RSVC without forming a constituent with it, because it is really adjoined to *pro*. If so, then the object *Uyi* should be extractable, leaving *tob<u>o</u>re* behind. (ii) shows that this is not the case. Thus, the complete distribution of *tob<u>o</u>re* is sufficient to show that there is no NP trace or *pro* associated with the verb2 anywhere in an RSVC.

(ii) *Úyì <u>ò</u>ré íràn sú!á tòb<u>ó</u>rè dé
Uyi FOC they push by.self fall.

Ozo is a typical academic who buys many books but only gets around to reading a few of them. This pattern of inferences found in CSVCs is familiar from the literature on E-type pronouns [Evans, 1980 #39]. (29) is comparable to Evans' well-known example in (30) in the relevant respects.

(30) 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 (29) in Edo are similar to those for its English translation, which has VP conjunction with a pronoun in the second conjunct related to the quantified object in the first conjunct. Now E-type readings of this kind typically arise only when a pronoun is interpreted as having a quantified antecedent that does not c-command it. Thus, we can deduce that there is a null pronominal associated with the verb2 in (29). In contrast, the absence of this E-type reading for the RSVC in (28) is constistent with our claim that there is no comparable empty category in RSVCs. Its interpretation is parallel not to an English conjunction with a pronoun (like *Ozo pushed two trees and they fell down*) but rather to an English resultative construction like *Ozo pushed two trees down*. This semantic distinction between RSVCs and CSVCs also carries over to Nupe and Yoruba:

(31) Musa si etsi dèégi gi. Nupe CSVC

Musa buy yam few eat

'Musa bought (a) few yams and ate (all of) them.'

(He bought only a few, and he ate all the ones he bought.)

(32) Musa fo èwò dèégi li Nupe RSVC

Musa wash garment few be.clean

'Musa washed (a) few garments clean.'

(He might have washed many, but only a few were both washed and got clean.)

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'It's Uyi that they pushed down by himself.'

This establishes our claim that the verbP2 of a CSVC contains a pronominal empty category. Moreover, that empty category apparently does not fall under the usual theory of control (contra Collins 1997), since obligatory control does not result in an E-type reading for the controlled element.[13]

Additional evidence is available that the gap following the verbP2 is a *wh*-trace in PSVCs but not in CSVCs. Consider, for example, the phenomenon that we call *relative tone* in Edo. Edo is like many African languages in that a special morphological marking appears on the verb of a clause from which something has been extracted by *wh*-movement. In Edo, this morphological marking is tonal in nature, and it shows up most clearly on bimoraic past tense verbs. These verbs normally have a Low-High tone pattern, as seen on the verb *kpaan* in (20b), for example. However, when a constituent is extracted from the clause, a floating high tone is added, causing the verb to be realized with a distinctive high-downstep-high tone pattern. The special tone pattern on the verb in the cleft example in (23) illustrates this (with *tob̲o̲re* removed). The same special tone shows up on verbs in relative clauses and constituent questions. While the exact principles that govern such forms are not entirely clear (see Haik [, 1990 #605] for one analysis), they do seem to be a reliable diagnostic for the presence of *wh*-movement. Now the Edo verb *mié̲n* 'see, find' does not take an agentive subject. Therefore, it is semantically incompatible with a CSVC structure, in which the shared subject must be interpretable as the true agent of both verbs (cf. the appendix for some discussion, especially example (99) and note 30). However, *mié̲n* readily forms PSVCs. This correlates with the fact that a bimoraic verb2 following *mié̲n* in Edo must appear in the special relative tone form, as shown by (33a). Minimally different is (33b), which contains the verb1 *gualo̲* 'seek'. This verb does take an agentive subject, so it is semantically capable of forming a true CSVC. As a result, the verb2 that appears after *gualo̲* has the ordinary low-high tone pattern.

(33) a. Òzó mié̲n àlìmói kpá!án.
Ozo find orange pluck
'Ozo found an orange to pluck (and did so).'

[13] Unfortunately, judgments seem murky as to whether the gap in the verbP2 of a PSVC has a reading like an E-type

b. Òzó guàlǫ́ àlìmói kpàán.

Ozo seek orange pluck

'Ozo looked for an orange and plucked it.'

This shows that *wh*-movement of a null operator takes place in the verbP2 of PSVCs but not CSVCs.

CSVCs also differ from PSVCs in where the gap within the verbP2 can be located. For CSVCs, the gap can only be in the direct object position. Thus, examples like (34) are impossible in Edo, where the verbP2 contains a gap, but it is the object of a preposition rather than the object of verb2 itself.

(34) *Òzó dé ágá tótàá yè/yì --.

Ozo buy chair sit on

'Ozo bought a chair and sat on it.'

(See also Collins 1997:477 on Ewe and Veenstra 1996 on instrumentals in Saramaccan.) However, when the verb1 is *miẹ́n*, which favors a PSVC structure (and the verb2 bears a floating high tone), the gap can be the object of a PP:

(35) Òzó miẹ́n ékítà rhié èmió!wó nà.

Ozo find dog give meat to

Ozo found a dog to give the meat to.'

It is also significant that the preposition 'to, for' in (35) appears in its mutated form *nà* rather than its usual form *nè*. The *nà* variant otherwise shows up if and only if the preposition has been stranded by *wh*-movement. Similar PSVCs with a stranded preposition are found in Yoruba (and arguabaly Nupe):

(36) Olú wa àpótí kó obẹ si. Yoruba

Olu find box put knife into

'Olu found a box to put the knife in.'

As in Edo, the Yoruba example is only felicitous with a few verbs such as 'find'. If one tries to create a CSVC using a different verb and with the gap in the object of a PP, the result is ungrammatical:

(37) *Olú sẹ àpótí kó obẹ si. Yoruba

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pronoun or not. Thus, we are not in a position to pursue this point one way or the other.

Olu make box put knife into

'Olu made a box and put the knife into it.

In general, all three languages allow some prepositions to be stranded in *wh*-constructions. These strandable prepositions can appear followed by a gap in PSVCs but not in CSVCs. This supports the claim that only the PSVCs are formed by operator movement. We will discuss why the null pronominal in a CSVC cannot be generated as the object of a preposition in section 6.

Similar evidence comes from double object constructions (DOCs). In ordinary CSVCs, only the second (theme) object of a ditransitive verb can be a gap that is understood as being coreferential with the object of the verb1. Thus, one finds contrasts like the following in Edo (see also Baker 1989 for Yoruba):

(38) a. Òzó rhié íghó hàé Úyì --

Ozo take money pay Uyi

'Ozo took some money and paid Uyi it.'

b. *Òzó lèlé Úyì hàé (ér̲è) íghó.

Ozo follow Uyi pay (him) money.

'Ozo followed Uyi and paid him money.'

In Nupe, which allows PSVCs more freely than Edo, both structures seem possible:

(39) a. Musa lá tsigbè ya nangi. (CSVC)

Musa take medicine give goat

'Musa took medicine and gave it to the goat.'

b. Musa wan nangi ya tsigbè. (PSVC)

Musa catch goat give medicine

'Musa caught a goat to give it medicine.'

However, (39b) is clearly a PSVC, not a CSVC, as shown by extraction evidence below. Examples like (39b) are also possible following *mi*ẹ́*n* 'find' in Edo—except that a weak pronoun appears in the first object position rather than a true gap:

(40) Òzó mi*ẹ́*n Úyì hàé ér̲è íghó. PSVC

Ozo find Uyi pay him money.

'Ozo found Uyi to paid him money.'

This difference between (40) in Edo and (39b) in Nupe recapitulates exactly a difference between the two languages that is seen in simple sentences. When the first object of a DOC is clefted or relativized, a resumptive pronoun must be left behind in Edo but not in Nupe:

(41) a. Úyì òré Òzó hàé *(érè) íghó. Edo

Uyi FOC Ozo pay him money

'It's Uyi that Ozo paid money.'

b. Etsu Musa ya -- èwò o. Nupe

chief Musa give garment FOC

'It's the chief that Musa gave a garment.'

Thus, the gap in PSVCs is like a *wh*-trace in that it can in principle be in the first object position or the second object position. Moreover, whether a trace in first object position must be spelled out as a resumptive pronoun varies systematically from language to language. In contrast, the gap in a CSVC can only be in the second object position. This confirms that the gap in CSVCs is not a *wh*-trace. Again, we return to why the *pro* in a CSVC is restricted in this way in section 6.

A final difference between the PSVC and the CSVC that is relevant to this point is the fact that the verbP2 is an island for (further) wh-extraction in a PSVC but not in a CSVC. This can be seen quite sharply in all three languages. Take, for example, the Edo example in (35). This is clearly a PSVC: the verb1 is nonagentive *mién*, the verb2 has an invariant high tone, and the gap is inside a PP. In this structure, the overt object of verb2 cannot be extracted by clefting:

(42) *Èmió!wó nà òré Òzó mién ékítà rhié -- nà.

Meat that FOC Ozo find dog give to

'It's this meat that Ozo found the dog to give to.'

In contrast, NPs can be clefted out of CSVCs like the following, in which the gap in verbP2 is the theme:

(43) a. Ékpétìn òré Òzó dé àkhé$_i$ mú *pro*$_i$ yì --

box FOC Ozo buy pot put *pro* into --

'It's a box that Ozo bought a pot and put it in.'

b. Òzó ò́ré Úyì rhié íghó haé -- *pro.* (Compare (38a))

Ozo FOC Uyi take money pay

'It's Ozo that Uyi took the money and paid.'

Similarly, in Nupe one can cleft the locative object out of a CSVC with a theme gap ((44b)), but one cannot cleft a theme object out of a PSVC with a locative gap ((44a)).

(44) a. *Èwò$_i$ Musa dzin kpati$_k$ lá $t_i$ dan $t_k$ o

garnent Musa make box put in FOC

'It's the shirt that Musa made a box to put in.'

b. Kpati bo$_i$ Musa dzin èwò$_k$ lá *pro$_k$* dan $t_i$ o

box LOC Musa make shirt take be.in FOC

'It's the box that Musa made a shirt and put it in.'

Also, (45) shows that the theme object of verb2 cannot be extracted from the example in (39b), where the gap is the first object of a DOC. On the other hand, (46) shows that the goal object of verb2 can be extracted from the example in (39a), where the gap is the second object of a DOC. This confirms that (39a) is a CSVC whereas (39b) is a PSVC, as we claimed above.

(45) *Tsigbè Musa wan nangi ya o.

medicine Musa catch goat give FOC

'It's medicine that Musa caught the goat to give.'

(46) Nangi Musa la tsigbè ya o.

Goat Musa take medicine give FOC

'It's a goat that Musa took medicine and gave it to.'

Similar extraction patterns are found with CSVCs and PSVCs in Yoruba as well.

These differences in extraction are expected by our proposal that PSVCs but not CSVCs contain a *wh*-trace and are formed by null operator movement. It is well-known that *wh*-movement creates an

island out of which another NP usually cannot be *wh*-moved without creating some degree of deviance. Thus, PSVCs are akin to *wh*-island configurations:

(47) *Medicine$_k$ FOC Musa catch goat$_i$ [Op$_i$ [give t$_i$ t$_k$ ]]

The same effect is found in English: we can have *I bought a book to give to Mary*, but not *?*Who did you buy a book to give to*. On the other hand, the grammaticality of extraction from CSVCs indicates that, among other things, there is no null operator with scope over verbP2 in those constructions. Thus, there is nothing that the gap in a CSVC can be the trace of, and the gap can only be a *pro*.[14]

(48) Goat$_i$ FOC Musa take medicine$_k$ [give t$_i$ pro$_k$ ]]

Thus, we have converging evidence that there is an empty category object in a CSVC, and that it is a null pronominal rather than a *wh*-trace. Previous literature has been confused on whether *wh*-movement occurs in SVCs or not, precisely because people have not distinguished CSVCs from PSVCs, we claim.

4.2. Why verbP2 must have its own object

The next question is why? Given that the verbP2 of a CSVC is struturally a vP, why must its theme argument be assigned to a *pro*, rather than to a *wh*-trace or directly to the object of the verb1? Conversely, why can't the theme argument of a VP or an AspP be assigned to a *pro*?

Consider first the question of why the vP2 of a CSVC cannot contain a *wh*-trace. Here a simple answer is available. *Wh*-traces must be bound by *wh*-operators. *Wh*-operators, in turn, must be in operator (A-bar) positions, such as the Specifier of CP. It is reasonable to say that the specifier of the Mood/Aspect Phrase that dominates vP2 in PSVCs is such an operator position, and that is where the null operator in PSVCs resides by Spell-Out, as we have been assuming. However, there is no Mood/Aspect Phrase over the vP2 in a CSVC, as shown in section 3. Hence, there is no place for an operator, and no possibility of having a wh-trace in these structures:

(49) a. Ozo find orange [$_{AspP}$ Op$_i$ Asp [$_{vP}$ pluck [ t$_i$ V]]]

[14] Note that the extraction in (48) apparently does not violate the Adjunct Island Condition, even though the vP2 in a CSVC is in an adjoined position. This is similar to the well-known fact that NPs can be extracted out of PP adjuncts in English (e.g. *Which sink did you wash the dishes in?*). Perhaps only full clauses count as Adjunct Islands.

b. *Ozo seek orange $(Op_i)$ $[_{vP}$ pluck $[ t_i$ V]]

Given that there is an empty category at all (for reasons that we take up in section 6), that empty category must be something other than a *wh*-trace—such as a *pro*.

Conversely, we can give a mechanical answer to the question of why the verbP2 must contain a *wh*-trace rather than a *pro* when it has an Aspect/Mood head. We can stipulate that the particular Asp head that appears in PSVCs is like a +*wh* complementizer in that it has a strong operator feature. This strong feature insures that the specifier of the AspP not only may but *must* contain a suitable operator. Thus, (50a) is ruled out because Asp has a strong feature that has not been checked.

(50) a. *Ozo [(Asp) find orange$_i$ $[_{AspP}$ $Asp_{[+OP]}$ $[_{vP}$ pluck $[ pro_i$ V]]]]

b. Ozo [(Asp) seek orange$_i$ $[_{vP}$ pluck $[ pro_i$ V]]]

The verbP2 in the CSVC in (50b) has no corresponding Asp, and therefore no head has an unchecked feature when *wh*-movement does not apply. We return to the deeper question of why these constructions must have some empty category or other from a less mechanical perspective in section 6.

The other important question is why can't a structure that contains a second vP forgo an empty category altogether, assigning the theme role directly to the object of the verb1, as happens in RSVCs. Baker 1989 claimed that such a structure was possible, so long as the verb2 counted as a second head of the verb phrase that is projected (also) from the verb1. This view entailed that SVCs formed out of two transitives (CSVCs in our current terminology) had exactly the same syntactic structure as SVCs formed out of a transitive verb and an unaccusative (RSVCs). However, we have seen a variety of data that show that this prediction is false, and will see more below.

Fortunately, an innovation has come into the theory since the time of Baker (1989) that we can use to explain in a principled way why this mode of thematic discharge is possible with unaccusative verbs but not with transitive ones. This is the idea that transitive constructions inherently involve more syntactic structure than unaccusative ones do. An unaccusative verb phrase can consist of only a VP,

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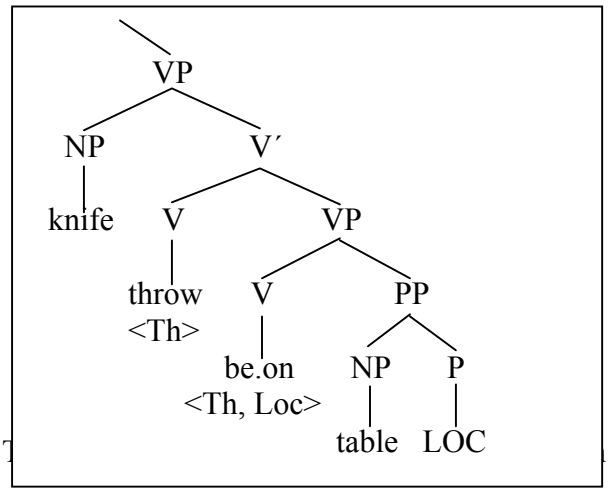
Veenstra 1996 cites intriguing evidence that the verbP2 of (certain) SVCs might be a weak island, blocking the extraction of adjuncts but not arguments, but we do not take this issue up here.

whereas a transitive verb phrase must contain a v projection (and usually an Active Voice projection) as well. To see why this is crucial, consider how the V2 in an RSVC can assign a theta-role directly to the object of V1, forgoing an empty category. Suppose that before V1 raises, the relevant structure is as follows, with the VP2 generated as the complement of V1:

(51) Musa throw knife be.on table (=(2a))




as goal PPs and resultative APs are in the standard view since Larson [, 1988 #140; 1991 #239]. This fits with the fact that resultative VPs are semantically similar to goal PPs and resultative APs: all three define the end point of the event, creating a telic predication. Now, how could V2 assign its theme theta role directly to 'knife' in a structure like (51)? The normal conditions on theta role assignment are not met here: 'knife' is too far from 'be.on' to get a theta role from it, since it is not contained in a projection of 'be.on'. Saito (2000) proposes an attractive answer. He argues that head movement can apply at LF in a way that feeds theta role assignment. Specifically, the V2 can move to adjoin to V1, thereby becoming close enough to the object to assign it its theme theta role. This idea of LF movement was previously used by Saito and Hoshi (1998) in their study of Light Verb Constructions ((54a)) and Restructuring constructions ((54b)) in Japanese.

(52) a. John-ga Mary-kara [hooseki-no ryakudatu]-o kokoromi-ta.
John-NOM Mary-from jewelry-GEN plunderage-ACC attempt-PAST
'John attempted to steal jewelry from Mary.'

b. John-ga rosiago-ga yom-e-ru.

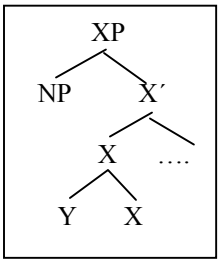
John-NOM Russian-NOM read-can-PRES

'John can read Russian.'

Like the West African RSVC, these constructions have two syntactically different heads that theta-mark the same NP. Both the verbal noun 'plunderage' and the verb 'attempt' take the subject 'John' as their external argument in (54a); similarly, 'John' counts as both the external argument of *yom* 'read' and *e* 'can' in (54b). Saito and Hoshi (1998) and Saito (2000) thus develop an analysis around the following two premises:

(53) a. The need for theta-role assignment can be the trigger for head movement (at LF).

b. Both X and Y can assign a theta-role to NP in the following configuration:




These axioms extend to the RSVC, essentially without revision. The only significant difference is that in RSVCs it is the theme/object argument receives the joint theta-role assignment after head movement, rather than a subject argument. Thus, the LF of (51) would be (54), a special case of (53b).[15]

(54) $[_{VP}$ knife be.on$_i$ + throw $[_{VP}$ t$_i$ $[_{PP}$ table LOC]]]

This proposal also fits well with the fact, well-known to Serialologists, that V-V incorporation happens overtly in resultative constructions in Igbo, a Nigerian language that is related to Edo and Nupe but does not have SVCs on the surface because verbs are more richly inflected (see section 2.3).

[15] Collins (1997:485) also assumes that the second verb incorporates into the first at LF in SVCs. However, there are two crucial differences between his view and the one defended here. First, in Collins' system the LF verb incorporation does not take away the need for the verb2 to theta mark an empty category. Second, Collins assumes

(55) Obi kwá-dà-rà Ézè. [Ihionu, 1992 #586:174]

Obi push-fall-FACT Eze

'Obi pushed Eze down.'

Assuming then that some version of Saito's analysis is correct for SVCs with an unaccusative verb2, we need to explain why a similar derivation is not possible with a transitive verb2 (a question that Saito does not take up). If it were, then transitive+transitive SVCs should be possible with the same empty-category-less structure as transitive+unaccusative SVCs in Edo and Nupe, contrary to fact. Also Igbo should have V-V compounds that correspond to CSVCs in Edo, which again is contrary to fact:

(56) *Àdá sì-rí-rí jí. Igbo

Ada cook-eat-FACT yam

'Ada cooked and ate the yams.'

This is where the idea that transitive verbs also involve a projection of v comes in. In order to form an RSVC-like structure with a transitive verb, one would need to generate a structure like (57).

(57) $[_{VP}$ food $\text{cook}_V$ $[_{vP}$ v $[_{VP}$ (NP) $\text{sell}_V$ ]]]

The V2 would raise to v (as usual) to create the verb 'sell'. Then at LF the complex v derived in this way would adjoin to the V1 for purposes of theta role assignment. But there is an important difference between this hypothetical derivation and the desired derivation in (54): unlike V, v is not a theta-role assigner in our view. V assigns Theme, and (active) Voice assigns Agent, but v assigns no theta-role; it only adds a semantic sense of causation and licenses accusative case on the object. Now if v is not itself a predicate, it is reasonable to say that it cannot enter into complex predicate formation. The trigger for LF head movement implied in (53a) would be missing in this case. This assumption is made explicit in (58), which is a special case of the general idea that Economy considerations block unmotivated movements.

(58) X and Y form a complex predicate only if there is some Z that X and Y both theta-mark.

In other words, multiple theta marking is not only possible in the (55b) configuration, but required.

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that exactly the same incorporation takes place in SVCs made from two transitive verbs (our CSVCs). This leads to the wrong pattern of facts, predicting that RSVCs and CSVCs should be more similar syntactically than they are.

Independent evidence for (58) comes from the study of English resultatives like *Chris beat the metal flat*. Such sentences entail not only that the metal was beaten by Chris, but also that (by the end of the event) the metal is flat. Thus, there is some kind of thematic relationship not only between the object and the verb, but also between the object and the adjective. However, if the adjective has no theta-role that it could assign to the direct object of the verb, a resultative construction is impossible:

(59) a. *Chris beat the metal [$_{AP}$ likely that it will break].

b. *Chris will push Pat [$_{AP}$ certain that he will cry].

Even the presence of an empty category inside the complement of the unaccusative/raising adjective does not make such sentences possible, as shown in (61).

(60) a. * Chris beat the metal$_i$ [likely [$t_i$ to break]].

b. *I encouraged Chris$_i$ [eager [PRO$_i$ to try water skiing again]].

c. *Mary edited the paper$_i$ [easi(er) [Op$_i$ [PRO to understand $t_i$ ]]].

Thus, it is not enough for the AP to be construable as being about the object of the verb in a broad sense; rather there must be an actual thematic relation between the adjective itself and the object. Our claim, then, is that CSVC structures like (57) are ungrammatical for the same reason as (59) and (60) are. This analysis goes through regardless of whatever NP is (or is not) generated in the specifier of VP2.

This completes the task of explaining why the theme role of verbP2 is assigned to *pro* if and only if verbP2 is a vP. The vP projection is not big enough to contain an A-bar position, so operator movement is not available; on the other hand, its head is not a theta-assigner, so it is too big to enter into complex predicate formation by incorporation. Using *pro* is the only remaining option.

**5. The position of the verbP2**

A desirable consequence of the analysis given above is that it can also be used to explain a key contrast that concerns where the verbP2 of a CSVC is generated, as compared to the verbP2 of an RSVC.

The Saito/Hoshi theory of complex predicate formation is founded on the idea that the verb2 in an RSVC incorporates into the verb1 at LF, prior to the interpretation of thematic relationships. This entails

that the verbP2 of an RSVC can only be generated in a position from which incorporation is possible; in short it must be the case that VP2 is the complement of the V1, as shown in (51). If VP2 were in some other position—say, an adjunct position—then this head movement would be impossible [Baker, 1988 #6], and environment for joint theta-role assignment could not be created. In this respect, RSVCs are expected to be similar to Light Verb Constructions, in which the theta-role assigning noun must be the syntactic direct object of the light verb, and to Restructuring Constructions, in which the projection of the lower verb must be the complement of the higher verb (see (52)).

There is empirical evidence in Edo that supports this structural prediction concerning RSVCs. First of all, if the VP2 must be a complement, then it should be in complementary distribution with goal PPs and resultative APs, which must also be generated in this unique syntactic position. The paradigm in (61) shows that this is correct: a transitive verb can be followed by a goal PP or a VP, but not both.

(61) a. Òzó fí àkhé yè òtíkù. Edo
Ozo throw pot in trash
'Ozo threw the pot into the trash.'

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

c. *?Òzó fí àkhé yè òtíkù guòghó.
Ozo throw pot in trash break.
'Ozo threw the pot into the trash so that it broke.'

The LF-incorporation theory also predicts that, as a complement of V1, the VP2 must come strictly before adverbs and adjunct PPs that are right-adjoined to a projection of V1. This is also correct:

(62) a. *Òzó suá àkhé ègìégìé/ vbè òwá dé.
Ozo push pot quickly/ in house fall
'Ozo pushed the pot quickly/in the house down.'

b. Òzó suá àkhé dé èg̀ié́g̀ié́/ vbè òwá.

Ozo push pot fall quickly/ in house

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

Now compare this situation with the CSVC. We saw in the last section that, unlike the RSVC, the head of the vP2 of a CSVC *cannot* undergo complex predicate formation with V1, because it has no theta role to assign that could justify the crucial incorporation. Therefore, at a minimum the vP2 of a CSVC does not have the same need to be the complement of V1 as VP does. We can strengthen this observation by making explicit the common assumption in (63).

(63) X can be the complement of Y if and only if X and Y enter into a thematic relationship.

Two kinds of thematic relations (at least) can satisfy (63): X can get a theta role from Y, or X and Y can form a complex predicate in which they jointly theta-mark some other category. However, a vP cannot enter into either kind of thematic relationship: it is not the right category for receiving a theta role [Baker, to appear #652], and its head does not have a theta role to give. Thus, we predict that the vP2 of a CSVC is barred from complement position and can only be an adjunct.

This prediction turns out to be correct. Unlike in RSVCs, the verbP2 of a CSVC can follow a goal PP or a resultative AP that is associated with the verb1. (64) contrasts with (61c).

(64) Òzó rhié ùkp̀ón yè ékpétìn khié́n. Edo

Ozo put cloth in box sell

'Ozo put the cloth in a box and sold it.'

Moreover, VP-final adverbs and PP adjuncts can come before the verbP2 of a CSVC in Edo:

(65) Òzó lé èvbàré èg̀ié́g̀ié́/ vbè òwá ré. (Contrast with (62))

Ozo cook food quickly/ in house eat

'Ozo cooked the food quickly/at home and ate it.'

See also Campbell [, 1996 #611:89] for the same contrast in Akan.[16] These data confirm that vP2 is not the complement of V1 in a CSVC; rather, it is some kind of adjunct, attached to the phrase marker either at the same level as locational PPs and manner adverbs, or somewhat higher.

Of course, this conclusion as it stands is a relatively crude one, implying only that the verbP2 of a CSVC must be some kind of adjunct by process of elimination, because it is not qualified to be a complement. It would be desirable to know more precisely what phrase the vP2 adjoins to and why. However, we must put this question of detail aside for now, until we know a bit more about the nature of adjunction. We return to this topic in a tentative way in the appendix, which discusses a subtle difference between CSVCs and PSVCs with respect to where the verbP2 attaches.

**6. The object of verbP2 (2): implications from Predication Theory**

The fact that the vP2 of a CSVC must be an adjunct also provides the key to understanding two other salient properties of object of the verb2 in this construction: the fact that it cannot be an overt NP, and the fact that it must be coreferent with the object of the verb1. Neither restriction holds of the object of a transitive verb in other syntactic environments. However, it turns out that both can be derived from the fact that an adjoined vP (or AspP) must be interpreted as a predicate in the sense of Williams' classic 1980 study of predication.

6.1 The necessity of a *pro* in CSVCs.

In section 4.1, we saw that the object of the second verb in a CSVC is *pro*, as opposed to a *wh*-trace or no empty category at all. However, the question also arises of why the object in vP2 cannot simply be an overt NP. In other words, why are sentences like (66) impossible in Edo and Nupe?[17]

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[16] However, the Nupe and Yoruba facts are different, because adverbs in these languages attach higher in the clause than they do in Edo: in Edo they adjoin to VP (or perhaps vP); in Nupe they adjoin to AspP (see the Appendix).

[17] In Nupe, this generalization is straightforwardly true. In Edo (and Yoruba), it is complicated by the existence of a distinct, Covert Coordination structure, which sometimes creates strings superficially similar to this (Baker 1989; Collins 1997). Thus, (66b) is marginally OK in Edo with a different tone pattern and phonological phrasing. Stewart 1998 discusses structural differences between Covert Coordinations and CSVCs, and gives syntactic tests that can tell them apart. Two important differences are that Covert Coordinations have evidence of a VoiceP inside the verbP2, and verbP-initial adverbs can take scope over only one verbP at a time in these constructions. Thus, Covert

(66) a. *Musa si èbi ba nakan. NUPE

Musa buy knife cut meat

'Musa bought a knife and cut the meat.'

b. *Òzó mi̱é̱n èrhán gu̱ó!gẖó̱ àkhé EDO

Ozo find stick break pot

'Ozo found a stick and (then) broke the pot.'

The Edo example in (66b) contrasts with the grammatical example in (67). This is a different kind of purposive-type construction, roughly comparable in its meaning to a PSVC. However, it has an overt Infl *ya* associated with the verbP2. Thus, it is not part of the SVC family of constructions according to the traditional definitions. Such purposive clauses do not have a gap following the second verb:

(67) Òzó mi̱é̱n èrhán yá gu̱ó!gẖó̱ àkhé EDO

Ozo find stick INF break pot

'Ozo found a stick in order to break the pot.'

Apparently, then, there is a requirement that the verbP2 of a CSVC—and a PSVC—must contain an empty category of some kind.

We can begin to understand this fact by comparing it to relative clauses in English, as in (68).

(68) a. (The management just fired) [the [ man [OP that I saw t]]].

b. (The management just fired) [the [man [PRO sitting over there]]]

(We need to find) [a [man] [PRO to do the job]]. (Williams 1980:230-31)

c. (The management just fired) *the [coach [that the team lost every game]].

The most familiar type of relative clause is illustrated in (68a). It contains an operator (phonologically null, in this case) in the specifier of its CP, which binds a trace somewhere inside the relative clause. This

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Coordinations fit into our general picture roughly as VoicePs adjoined to a VoiceP, in contrast to CSVCs (vP adjoined to vP), PSVCs (AspP adjoined to AspP), and true Purposives (TP adjoined to TP).

In both Edo and Nupe, the sentences in (66) become good if a verb meaning 'take' is substituted for the more meaningful verb1 (*lá* 'take' in Nupe, *ya* 'use' or *rhie/mu* 'take' in Edo). This is a fixed instrumental construction, which we put aside here. Stewart 1998:ch 7 explores the properties of the Edo version of this constuction, which he analyzes as an instance of relatively normal infinitival complementation.

operator is also related to the NP that the relative clause is attached to, a relationship traditionally indicated by coindexing (R-binding, in the terms of Safir [, 1986 #658]). (68b) illustrates participial and infinitival relatives. They do not involve *wh*-movement; rather, they have a null pronominal PRO in the highest subject position of the nonfinite clause. Like the null operator in (68a), this PRO is necessarily coindexed with the head of the relative. Finally, (68c) shows that a clause cannot be used as a modifier to a noun phrase in English unless it has one or the other of these two kinds of gaps, even when the clause can easily be understood as being a comment on the head NP.[18] This familiar English paradigm is strikingly similar to the SVC facts we are considering. In particular, PSVCs are parallel to ordinary tensed relative clauses: in both cases the second phrase is connected to the first by a *wh*-chain. CSVCs, on the other hand, are parallel to infinitival and participial relatives: in these cases, the second phrase is connected to the first by a null pronominal in its highest specifier position. (We will not distinguish between PRO and *pro* in their ability to create predicates; see sources like Borer and Huang [, 1984 #49]for unified approaches to these two elements.) Finally, the ungrammaticality of the gapless SVCs in (67) is parallel to the ungrammaticality of the gapless relative clause in (68c). Intuitively, the second phrase is not "connected" to the first by a licit grammatical relationship, so it does not count as licensed.

The traditional account of the relative clause paradigm in (68) is in terms of the theory of Predication, as in the line of research initiated by Williams (1980). We propose to generalize the core ideas of this theory to the domain of SVCs, so that these parallels are captured.[19] Relative clauses and the vP2 of CSVCs share the property of being adjuncts: relative clauses are adjoined to the NP that immediately precedes them, and vP2s are adjoined to the verbP1, as we have seen. As such, both constituents are optional, in the sense that a phrase that contains a relative clause or a verbP2 is usually also thematically and structurally complete with that constituent removed. Now according to the Principle of Full Interpretation of Chomsky [, 1986 #23] and subsequent work, every constituent of a

[18] Gapless relative clauses like (68c) are acceptable in Japanese and some other "topic prominent" languages. Apparently, CPs are automatically predicative in these languages, but we leave open the question of why.

clause must be integrated into the interpretation of that clause in accordance with one of a finite number of possibilities that are sanctioned by the human language faculty. As adjuncts, relative clauses and vP2s are not licensed by theta-role assignment or by any other form of lexical selection. Nor can their heads incorporate to form a complex predicate in the sense of (53). Therefore, such phrases can be present in the structure only if they are predicated of some other phrase in that structure. This is stated explicitly in (69) (which might have other clauses as well).

(69) (Corollary of) *Full Interpretation*: A phrase X is permitted at LF if and only if:

(i) it is selected by a lexical item, or

(ii) it enters into a substantive complex predicate relation (see (53)), or

(iii) X is predicated of some other phrase Y in the structure, or …

Next, Williams 1980 emphasizes that predication can only hold between two phrases if certain syntactic conditions hold. In particular, he argues for (70):

(70) X is predicated of Y only if X and Y c-command each other and X is coindexed with Y.[20]

The mutual c-command condition is trivially satisfied in the structures we are considering, because an adjunct is always in a relationship of mutual c-command with the phrase that it is adjoined to. However, for predication to hold, another condition must also be met, which Williams and others have usually represented in terms of coindexing. Thus, we must consider how a phrase can come to bear an index.[21]

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[19]In this, we follow the lead of Collins 1997, who also applies Williams' theory of predication to SVCs—although again there as many differences as similarities. For example, Collins does not study the wh-movement option and the control option in parallel, and for Collins the predicative phrases are complements, not adjuncts.

[20] Note that (70) says "X (the predicate) must be coindexed with Y (the subject)", not "X and Y must be coindexed." Technically, we assume that indexing is an asymmetrical relationship, not a symmetrical one; in other words, coindexing should ultimately be replaced with linking in the sense of Higginbotham [, 1983 #46]. This is important because it means that the predicate (which follows its subject by general principles of word order) must contain the referentially dependent item (*pro* or a null operator). In this way, we can derive the fact that *Ozo [cook food] [sell pro]* is grammatical, but **Ozo [cook pro] [sell food]* is not. Nevertheless, we use the notation of indices rather than linking in the body of this paper, because it is more familiar and graphically more convenient.

[21] One characteristic of the Minimalist Program in Chomsky 1995 has been to eliminate indices from syntactic representations, as a special case of the Inclusiveness Condition, which says that there can be nothing in a syntactic representation that is not drawn directly from the lexicon. Chomsky suggests that the kinds of referential dependencies that were formerly indicated by indexing relationships are actually not part of the narrow syntax, but rather are part of how strictly syntactic relationships are interpreted at the Conceptual-Intentional Interface. Williams-style predication indices can be eliminated from the strict syntax in exactly the same way. Nevertheless, in this paper we will maintain the terminology of indices for expositional purposes, because it is an explicit and

In the "On Binding" era framework assumed by Williams, the NPs that were the potential subjects of predication had indices by convention (by the level of S-structure). Baker [, to appear #652] revives a modern version of this idea. Baker argues that it is the ability to introduce a referential index into the representation that makes a category nominal, as opposed to verbal or adjectival. Among other things, this expresses the fact that NPs alone of the lexical categories can be antecedents for pronouns, can enter into binding chains, and can receive theta-roles from a verb or preposition.

(71) Only NPs/DPs have indexes inherently.

Lexical NPs have novel indices; empty category NPs/DPs have indices that are identical to that of some other element in the representation (Baker, to appear)

More specifically, Baker assumes that all NPs with lexical content bear a novel index. If the NP is definite, this index is presupposed to refer to the same entity as some other index in the structure, with sameness judged in accordance with the "Criterion of Identity" implicit in the noun's lexical semantics [Geach, 1962 #571; Gupta, 1980 #570]. This is essentially the same as the way reference is handled in the Discourse Representation Theory of Kamp and Reyle [, 1993 #394], in which every overt NP introduces a new discourse referent, but many of those referents are equated with each other by identity conditions. However, empty categories are exceptions to this general rule. They have no lexical content, so they bring no Criterion of Identity of their own by which sameness of reference can be judged. Therefore, they have no power to introduce a new index/discourse referent into the representation. Rather, they must bear the same index as something else in the structure. This will allow empty categories to play a special role in predication.

Beyond the inherent indices on NPs that relate to their capacity for reference, Williams claimed that additional indices were assigned to other phrases by explicit rules of predication. These rules were subject to the mutual c-command condition in (70). For Williams, a category could be a candidate for being a predicate in one of two ways. First, it could be a simple, headed predicate, such as an AP in

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perspicuous format. Crucially, we do not use these indices in a dynamic way internal to the computation that builds a clause up from its parts. Because of this, it should be easy to bring our proposals into line with the Inclusiveness

Williams' system. Second, and more relevant to our purposes, Williams claimed that complex predicates could be constructed out of clauses by providing them with an "open position" that acted as a predicate variable. Williams explicitly stated two ways in which this can happen: stated in contemporary terms, there can be an operator in the Spec of a CP, or there can be a PRO in the subject position of a nonfinite clause. Thus, the two kinds of predicative clauses for Williams were [$_S$ PRO VP] and [$_{CP}$ {PRO/WH} S]. Taking a small step beyond Williams' exposition, we can generalize over the two cases as follows:

(72) Phrases which do not have an index inherently (phrases other than NP/DP) can acquire an index from the highest NP/DP that they contain.

"Highest NP" here is defined in the usual way in terms of c-command: X is the highest NP in phrase Y iff for every NP Z in Y, X c-commands Z. Williams' predicative clauses are clearly special cases of (72). In particular, a nonnominal adjunct phrase like CP is only licensed as a predicate if it is coindexed with some other phrase. Such coindexing will only arise if (i) the CP contains a highest NP from which it can get an index, and (ii) if that NP is an empty category, whose index is not novel but capable of being the same as some other NP (the subject of predication). Williams simply listed extensionally the two ways these demands can be met, consistent with phrase structure and the typology of empty categories.

So far, this is no more than a slight up-dating of Williams' 1980 analysis of relative clauses and similar constructions. It gives the following representations to the syntactic structures in (68):

(73) a. … the [ man$_i$ [$_{CPi}$ OP$_i$ that [I saw t$_i$]]].

b. … the [ man$_i$ [$_{IPi}$ PRO$_i$ sitting over there ]]

c. … *the [coach$_i$ [$_{CPk}$ that [the team$_k$ lost every game]].

In (73a) and (73b), the clause ends up being predicated of the NP it is adjoined to, satisfying Full Interpretation. However, if a clause has no empty category in its highest position, it cannot be coindexed with the NP it is adjoined to, as in (73c). Thus, it cannot be a predicate of that NP. In the absence of some language-specific interpretation procedure that can apply to it, it is ruled out by Full Interpretation.

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Condition by recasting the relationships we indicate by indexation as holding at the Conceptual-Intentional interface.

Now, we can generalize this line of reasoning from relative clauses to SVCs, given the articulated clause structure we assumed in (5). Whereas ordinary relative clauses are CP or TP projections that are predicated of an NP, CSVCs are vP projections that are predicated of the verbP1. Like relative clauses, the vP will not count as a predicate unless it contains an empty category in the proper position inside it. This explains why examples like (66) are ruled out, parallel to gapless relative clauses like (68c). PSVCs also fit nicely into this picture: they contain an AspP that is made into a possible predicate by null operator movement, whereas CSVCs contain a vP that is made into a possible predicate by a *pro* subject. In other words, we have the following analogy: CSVCs : PSVCs :: infinitival relatives : tensed relatives. The three SVC structures are given schematically in (74), to emphasize the parallel with (73).

(74) a. Ozo will [$_{\text{VerbP}i}$ find yam$_i$ ] [$_{\text{AspP}i}$ OP$_i$ Asp [$_{\text{vP}}$ cook [$_{\text{VP}}$ t$_i$ V ]]] PSVC

b. Ozo will [$_{\text{VerbP}i}$ hit goat$_i$ ] [$_{\text{vP}i}$ sell [$_{\text{VP}}$ pro$_i$ V]] CSVC

c. *Ozo will [$_{\text{VerbP}i}$ find stick$_i$ ] [$_{\text{VerbP}k}$ (ASP) break pot$_k$ ]

In fact, Williams [, 1980 #238:231-32] already gave roughly the analysis in (74a) for the English equivalent of the PSVC—purposive clauses such as *I bought it [OP$_i$ [to read t$_i$]]*. For this construction, our account differs from his only in three respects. First, we claim that the subject of predication of the purposive clause is really the verbP1, not the object of the verb1, as Williams and others have assumed. We return to some implications of this in the next subsection. Second, we show that the null pronoun strategy of becoming a predicate is attested along side of the null operator strategy in languages of the world.[22] As a result, CSVCs exist as well as PSVCs. Finally, our analysis crucially capitalizes on the

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22 Indeed, the null pronoun strategy for creating predicates may be more widespread than has been realized. For example, there is another place in the grammar of Edo where something similar seems to be going on. This concerns the use of determined adjectives to modify nouns. Edo allows a construction in which a null pronominal can have an adjective adjoin to it if and only if it is the complement of the definite determiner *né*:

(i) ì ghá dẹ̀ [$_{\text{DP}}$ *(né) [$_{\text{NP}}$ *pro* pẹ̀rhẹ̀].
I will buy the flat
'I will buy the flat one.'

This same sequence of *né*+adjective can be adjoined to a noun phrase, as in (ii), which is perhaps the most common form of attributive modification in Edo [Omoruyi, 1986 #483].

relatively recent idea that the agent theta role is assigned to the subject not by the verb itself, but by a higher head, for which we use Kratzer's label Voice. Without this idea, it would be hard to explain why a *subject* gap is not enough to make the verbP2 into a predicate in SVCs. Superficially, the verbP2 of a CSVC or a PSVC is missing a subject as well as an object. Why then is it necessary for an *object* (or some other verbP-internal NP, in the case of PSVCs) to be an empty category? The contemporary view of phrase structure provides an answer to this question by saying that the verbP2 in CSVCs (and PSVCs) is not big enough to contain a subject position. The verbP2 is a vP or an AspP, but crucially not a VoiceP. Thus, there is no agent position that could contain an empty category, and the verbP2 needs to have an empty category that gives it a dependent index somewhere else.

In this light, consider again the contrast between the SVCs and Edo's true purpose construction:

(75) Òzó miẹ́n èrhán yá guó!ghó̱ àkhé Edo purposive (=(67))
Ozo find stick INF break pot
'Ozo found a stick in order to break the pot.'

Unlike the SVCs, this purposive construction does not have an empty category object after the second verb. This correlates with the fact that the true purposive construction also has a tense-like particle *ya* before the second verb, unlike the SVCs. Why should this be? Its word order with respect to adverbs shows that the particle *ya* is an element of category T, like the finite tense particles, not an Asp. Its

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(ii) Ì ghá dè ágá né!-pèrhè̱.
I FUT buy chair the-flat.
'I will buy the flat chair.'

Given the comparison with (i), (ii) presumably has the structure (iii).

(iii) [[$_{DP_i}$ ágá] [$_{DP_i}$ né [$_{NP}$ *pro*$_i$ pèrhè̱]].

However, if the *pro* in this structure is replaced with a lexical noun, the same adjunction structure is unacceptable:

(iv) *[[$_{DP_i}$ ágá] [$_{DP_i}$ né [$_{NP}$ *ágá*$_i$ pèrhè̱]].
Chair the chair flat 'the flat chair' (lit. 'the chair, the flat chair')

We interpret this as another case of the principles of predication at work. The *pro* in (iii) makes the second DP into a possible predicate, so the adjunction structure interpretable at LF. However, if there is no *pro*, as in (iv), then predication fails, and with it Full Interpretation. DP adjuncts with an overt N are bad for essentially the same reason that SVCs with an overt object in verbP2 and relative clauses without a gap are bad: there is no predication.

presence in (75) thus indicates that the verbP2 is bigger than in the structures we have considered: it is at least a TP. But TPs also contains VoicePs, given the sequence of heads in (5). This means that the verbP2 in (75) also contains a position for an agentive subject. In (75), that structural subject is a null pronominal (probably PRO). This pronominal can give a dependent index to the whole phrase, so that it can be licensed as a predicate. The structure would be a TP predicated of a TP, as shown in (76).

(76) $[[_{TPk}$ Òzó$_k$ T [find stick ]] $[_{TPk}$ *ya* $[_{VoiceP}$ PRO$_k$ [break pot]]]]

This claim that the purposive construction in (75) contains a subject PRO, but the verbP2 of CSVCs and PSVCs do not can be tested with *tòbọ́rè* in Edo. We saw in section 4.1 that *tòbọ́rè* can right-adjoin to most NPs, including *pro* and PRO (if these are different). Therefore, our analysis predicts that an agent-oriented use of *tòbọ́rè* should be possible before the verbP2 of a purposive construction like (75), but not before the verbP2 of a CSVC or a PSVC. The contrasts in (77) show that this prediction is correct:[23]

(77) a. Èmọ́ lé èvbàré (*tòbíràn) ré. CSVC
children cooked food by.selves ate
'The children cooked some food and (*by themselves) ate it.'

b. Èmọ́ miẹ́n ìyán (*tòbíràn) lé. PSVC
children find yam by.self cook
'The children found a yam to cook (*by themselves).'

c. Èmọ́ miẹ́n èrhán yá tòbíràn guọ́!ghọ́ àkhé. Purposive
children find stick to by.self break pot
'The children found a stick in order to break the pot by themselves.'

[23] (77a) also shows that *tòbọ́rè* is not simply an adverb, since ordinary adverbs can come before the verb2 of a CSVC (see (17)). This confirms that *tòbọ́rè* is licensed by attaching to (possibly null) NP positions.

This confirms that all predicates of verbP must contain exactly one empty category. This empty category can be the agentive subject if the predicate contains one, but if it does not (as in CSVCs), then an empty category object is required.[24]

6.2 The interpretation of the *pro* in CSVCs

The theory of predication also gives us a way of explaining a last curious fact about the *pro* in CSVCs: the fact that it must be understood as refering to the direct object of the verb1. This type of restriction does not normally hold of *pro* or other pronouns. On the contrary, pronominals typically do not need an antecedent anywhere in the sentence, and if they have an antecedent at all its position is quite free. Why then is this freedom not available to the *pro* in the vP2 of a CSVC?

In fact, a similar restriction is known to hold in more familiar cases of predication. Williams 1980 shows that there are tight constraints on what can be the apparent subject of a predicative adjunct that is attached to VP. Specifically, he shows that the predicate must be related to an overt NP argument that receives a theme theta-role from the verb. His generalization holds for both simple AP secondary predicates and for the kind of purposive construction that is similar to PSVCs in Edo and Nupe. (78) illustrates this characteristic paradigm for the English purposive construction:

(78) a. I gave Pete the book$_i$ to read --$_i$.

b. *I gave Pete$_i$ the book to impress --$_i$.

c. I presented it$_i$ to Bill to read --$_i$.

d. *I presented Bill with it$_i$ to read --$_i$.

e. I wrote Bill a letter$_i$ to read --$_i$.

f. *I wrote Bill to read --$_i$.

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[24]For completeness, one might also ask why one cannot have a structure like *Ozo [$_{vP}$ hit [[[$_{VPi}$ pot$_i$ V] (quickly)] [$_{VPi}$ pro$_i$ break ]]*, in which a VP has a *pro* as its specifier, making VP into an adjunct that can be licensed by predication. If this were possible, then we should observe transitive-plus-unaccusative SVCs in which the VP2 does not act like a complement of the V1, contrary to fact (see section 5). Probably such structures are ruled out because v plays a crucial role in the licensing of *pro*. Rizzi [, 1986 #86] argues that object *pro* in Italian must be Case-marked by a transitive verb. In current terms, this implies that v is necessary to the appearance of *pro*. Parallel arguments can be constructed in Edo for the use of *pro* in conditional clauses, mentioned in footnote 28. This then can explain why *pro* is possible in the vP2 of CSVCs, but not in the VP2 of an RSVC-like structure.

(78a) and (78b) show that the understood object of the verb in a purposive clause can be the same as the second (theme) object of a double object construction in the matrix clause, but it cannot be the same as the first (goal) object. (78d) shows that the understood object in a purposive construction cannot be the same as the object of a prepositional phrase, even though it can be the same as a semantically similar argument that is expressed as a direct object ((78c)). Finally, (78e) and (78f) show that a purposive clause needs to have an overt NP that it can be interpreted with respect to; an implicit theme that is entailed by the verb's lexical semantics is not good enough. Williams (1980:27) captures this range of facts by adding the stipulation in (79) to his theory of predication.

(79) If X (a potential predicate) is in the VP, then X is predicated of the theme of V.

If the vP2 of a CSVC is indeed liscensed by predication, then it should obey these same restrictions. This turns out to be the case. (80) shows in a single sentence that the object of vP2 must be understood as the second object of verb1, not as the first, indirect object. (The first object here is semantically a source, rather than a goal, as first objects are in English. This rather systematic difference between Edo and English does not seem to affect the syntax of the double object construction at all.)

(80) Òzó vbó òkhókhò ìgàn khién. Edo
Ozo pluck chicken feathers sell
'Ozo plucked the chicken of feathers and sold them (the feathers).'
NOT: 'Ozo plucked the chicken of feathers and sold it (the chicken).'

Notice that this is the opposite of what would be the pragmatically most plausible interpretation for this string of words. The minimal pair in (81) shows that the understood object of the verb2 can be interpreted as the direct object of the verb1 but not as verb1's prepositional object.

(81) a. *Òzó tùé ùmwén yè èmió!wó lé. Edo
Ozo pour salt onto meat cook
'Ozo poured salt onto the meat and cooked it (the meat).'

b. Ozo rhié èmió!wó yè epani lé.
Ozo put meat in pan cook

'Ozo put the meat in a pan and cooked it.'

Finally, one can never have a CSVC in which the first verb is unergative, and thus has no syntactic object that can be predicated of. This is true regardless of the structure of the verbP2—whether the verb2 is also unergative, or whether it is transitive with an overt (or covert) object:[25]

(82) a. *Ékítà gié!gié gbó!ó khú áhiánmwèn. Edo
dog quickly bark chase bird.
'The dog quickly barked and chased a bird.'

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

Over all, then, these facts support the claim that CSVCs are subject to the same principles as clear cases of secondary predication in other languages. (Similar restrictions also hold of PSVCs, as expected.)

Whereas Williams 1980 states (79) as an extrinsic constraint on rules of predication, we can make substantial progress toward explaining it in terms of more basic principles of grammar. The question to face is what is so special about the NP that bears the theme theta role, that it should be the understood subject of predication? We already have seen one answer to this question, in our discussion of how the vP2 of a CSVC is licensed: the theme NP is structurally the highest NP within the vP. As such, it and it alone can pass its index on to the vP as a whole, allowing the vP to enter into a relationship of predication. Previously, we considered these dynamics only with respect to the vP2 of a CSVC. However, exactly the same reasoning applies to the verbP1. Here is why.

Unlike Williams, we assume that the verbP2 in CSVCs (and PSVCs, in Edo and English) is actually predicated of the verbP1, not of the NP object. Semantically, this makes a good deal of sense, since the verbP2 does not merely modify the object of the verb1 (as a relative clause would); rather, it

[25] VP-initial adverbs are included in these examples to ensure that they are CSVC-like structures, one important difference between CSVCs and covert coordinations being the fact that an adverb before a CSVC can have scope over both verbPs (see note 17 and Stewart 1998). Without the adverbs and with a different phonological phrasing,

gives an additional characterization of the event described by the first verbP. In English, there is some phrase structure evidence that the purposive clause is not contained in the smallest verbal projection. Thus, a purposive clause need not be fronted in VP-preposing, nor replaced in VP pronominalization:

(83) a. I predicted that John would buy a book, and [buy a book] he did, to read to his children.

b. John bought a [copy of *War and Peace*] to give to Mary, and Sue [did so] to read herself.

Furthermore, the verbP2 appears most naturally *after* VP-final adverbs that are associated with the first verb, both in English purposive constructions (*John found a book quickly to read to his children*) and in Edo CSVCs (see (65)). These considerations all suggest that the detailed phrase structure of a purposive clause is more like (83a) than like (83b) (see the appendix for refinements).

(84) a. I $[_{vP}$ $[_{vP}$ $[_{vP}$ buy b ook] (Adv)] $[_{vP}$ (to) read]]

b. I $[_{vP}$ buy book $[_{vP}$ (to) read]]

But *book* does not c-command *read* in (84a) under a strict definition of c-command. Therefore, the mutual c-command condition would have to be revised or abandoned if *read* is really predicated of a *book*, as Williams assumes for English. However, the verbP2 in (84a) is in a mutual c-command relationship to the whole verbP1 *[buy book]*. Thus, we assume this is the true relationship of predication.

Now, if the verbP1 of a CSVC is the true subject of predication, the question arises of how it gets the index it needs in order to be coindexed with the verbP2. Since it is not a nominal category, it does not bear an index inherently. Rather, it must inherit an index from the highest index-bearing NP it contains, just as the verbP2 must. Moreover, what this highest NP can be is very limited. The Asp of verbP1 typically does not bear an operator feature. Thus, operator movement does not happen internal to the verbP1, the way it does in the verbP2 of a PSVC. Therefore, the highest NP in verbP1 will always be the theme, since the agent is not in verbP1 at all, and PP arguments will be complements of V1, hence lower than the theme NP in Spec, VP.[26] Even in a double object construction, the theme is the highest NP

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the examples in (82) are marginally possible as covert coordinations. Similar examples are straightforwardly bad in Nupe, in which covert coordination is not permitted. (This is also true for example (86) below.)

[26] One might wonder whether verbP1 could receive an index from the object of a PP in the special case in which the verb does not select a theme argument. This would produce examples like *Ozo sat on chair broke* (meaning that

inside vP, under relatively standard neo-Larsonian assumptions. Although it is true that the goal/source object is structurally higher than the theme object, as Larson 1988 showed, it is reasonable to say it is the specifier of a functional head that is higher than v. As such, the goal/source object is not low enough in the structure to give its index to vP, just as an agent phrase introduced in Spec, VoiceP is not.[27] Thus, in all the relevant configurations, verbP1 gets the index it needs to enter into predication from the theme argument. This results in the licit representation in (85a).

(85) a. I [[$_{\text{verbPi}}$ cook food$_i$] [$_{\text{vPi}}$ sell pro $_i$ ]]] CSVC

b. I [[$_{\text{verbPi}}$ find yam$_i$] [$_{\text{Aspi}}$ Op$_i$ [$_{\text{vP}}$ cook t$_i$ ]]] PSVC

In short, the gap in the verbP2 must be interpretated as being coreferential with the direct object of the verbP1, not because verbP2 is predicated of the object, but rather as an indirect consequence of the fact that verbP2 is predicated of the verbP1 and verb phrases do not bear indices inherently. Intuitively, the two verb phrases can be "stitched together" only by virtue of the NPs they contain. (Similar reasoning also applies to PSVCs, as indicated in (85b).)

For CSVCs, then, there will be a strict parallelism between what can be the gap in vP2 and what can be the antecedent of the gap in vP1. This parallelism follows because the predicate and the subject of

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Ozo sat on the chair and broke it). In fact, such examples are bad in Edo. We assume that the situation being imagined cannot arise as such. PP arguments are consistently interpreted as goals, sources, or some other kind of path. However, the pressence of a path implies also the pressence of a theme that transverses the path. This theme will be higher than the PP, and will give its index to the phrase as a whole. (For example, we assume that 'sit' in Edo is an unaccusative verb. Therefore, the index for a vP1 containing 'sit' would come from the trace of the subject, and not from the object of the preposition, leading to an incoherent interpretation for *sit on chair break* )

[27] This of course leaves open many details about the exact structure of the double object construction, which is a source of endless debate. For example, the higher head that the first object is the specifier of could be understood as a theta-marking light verb, as in Marantz [, 1993 #245] and much subsequent work. Alternatively, it could be a Case-checking functional head, as in Travis [, 1991 #141]. The first object could be generated in this high position from the start, or it could originate below the theme NP and reach that position as a result of an NP movement [Baker, 1996 #425]. However these details are filled in, an account in these terms should be workable.

Other questions arise concerning examples in which the verbP2 of a CSVC contains a ditransitive verb, as in cases like *Ozo take money pay Uyi* in Edo (see (38a)). If the verbP2 is only a vP in these cases, and if the first object of a DOC sits in the specifier of a higher head, then this example must not have the structure of an ordinary DOC. In fact, such structures are not uniformly grammatical in Edo. For those examples that are grammatical, we assume that the goal object exceptionally remains in the complement position of VP, giving a structure like Ozo [vP$_i$ take money$_i$] [vP$_i$ pay [pro$_i$ V Uyi]]. There is some empirical evidence for this structural distiction. Normally when the first object of a DOC is extracted in Edo, a resumptive pronoun must be left behind (see (41a)). However, when the goal object of 'pay' is extracted from the vP2 of a CSVC, no resumptive pronoun appears ((43b)). This supports the claim that the goal object is in a different structural position in CSVCs—indeed, a properly governed position.

predication receive their indices in the same way. And this fits with what we observe. Thus, (34) and (37) showed that the gap in a CSVC cannot be the object of a P, and (81a) shows that the antecendent cannot be the object of a P. (38b) showed that the gap in a CSVC cannot be the first object of a double object construction, and (80) shows that the antecendent cannot be the first object of a double object construction. Finally, (82) shows that the verb1 of a CSVC cannot be an unergative verb, and (86) shows that the verb2 cannot be an unergative verb.

(86) *Ékítà khú áhiánmwẹ̀n gbòó.
Dog chase bird bark
'The dog chased a bird and barked.'

In (86), as in (82), there is simply no NP inside the vP2 that can give it an index. It is an elegant feature of our theory that it captures these parallels in a natural way.[28]

**7. Conclusion**

In this paper, we have seen that when a language has morphological features that allow more than one verb to appear under a single Tense node, the result is not one kind of SVC, or 27 kinds of SVCs, but (roughly) three kinds of SVCs. These manifest the different structures that can be constructed out of more than one verbal projection without violating general principles related to Full Interpretation. Multiple verb constructions of one kind can feed into the theory of complex predicate formation (otherwise used for Light Verb Constructions and Restructuring); the result is an RSVC. Another kind of multiple verb construction can feed into the theory of predication (otherwise used for relative clauses, among other things); the result is a CSVC or a PSVC, depending on what kind of empty category is used

[28] One topic we do not take up in detail is why *pro* is licensed only in the object position of CSVCs. In Edo, the only other environment in which *pro* can also be used as a direct object is in the consequent clause of a conditional, as shown in (i) (see Collins 1997 for similar data in Ewe). Simple sequences of sentences like "The teacher bought a book$_i$. I read *pro*$_i$" are bad. We tentatively assume that the coindexing induced by predication helps to identify the formal features of *pro*—features which otherwise would not be identified in agreement-less languages like Edo and Nupe (see Rizzi 1986, who argues that *pro* needs both formal licensing and feature identification in general).

(i) 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.'

to create the predicate. These different possibilities are essentially those one expects if one verbal projection can combine with another of the same type at any level of structure: two V projections can combine (RSVC), or two v projections can combine (CSVC), or two Asp projections can combine (PSVC). The idea that LF incorporation, or predication, or control, or null-operator movement might be involved in the formation of SVCs is not new in itself; all of these mechanisms have been applied to the study of (some) SVCs in the previous generative literature on this topic. However, we claim to have finally sorted out which of these syntactic relations are involved in which particular SVCs, and to have taken steps toward explaining why each relation is limited to a particular subtype of SVCs in the way that it is. As a result, we do not need construction-specific principles to say why these particular configurations are possible and other, mixed configurations are not. The existing structures emerge as the only ones that succeed in satisfying independently known principles of grammar. In this way, we have approached the ideal of explaining the properties of serial verb constructions—particularly the CSVC—without having any theoretically significant notion of construction.

**Appendix: on the exact adjunction site of the verbP2 in CSVCs.**

There is one detail about the location of the verbP2 in SVCs that we have not derived from independently motivated principles of syntax so far. In the body of the paper, we showed that the verbP2 of an RSVC is structurally the complement of the verb1, whereas the verbP2 of a CSVC (or a PSVC) is structurally adjoined to some projection of the verb1. We explained this basic contrast in terms of the idea that the head of a VP may and must undergo incorporation to create a complex predicate, whereas a vP or an AspP has no theta role associated with it, and can only be licensed by being predicated of the verbP1. However, there is also evidence that the vP2 of a CSVC and the AspP2 of a PSVC, while both predicates, are not adjoined to exactly the same node. In this appendix, we will sketch a possible way of accounting for this "second order" contrast by extending a well-known semantic constraint on conjunction.

The evidence that the vP2 of a CSVC adjoins to vP1 but the AspP2 of a PSVC adjoins higher comes mostly from Nupe. Nupe has an interesting purposive construction, in which a verb of motion

selects a clause-like complement. When the complement contains an ordinary transitive verb, the object is preposed to a position before the embedded verb. The verb is followed by the particle *zì*:

(87) Musa bé etsi (yin) du zì
Musa come yam PRT cook PURP
'Musa came to cook the yam.'

We assume that this *zì* is a nonfinite functional head that is selected by the matrix verb of motion *bé*. Since the complement of *bé* does not appear to contain a subject, it is reasonable to say that *zì* is of category Asp, the functional head that is just below Voice. What is special about this particular functional head is that its projection is head-final. Thus, we can get information about where the verbP2s of SVCs attach by looking at their word order with respect to this particle. In fact, the vP2 of a CSVC always comes before *zi*, whereas the verbP2 of a PSVC must come after *zi*, as shown in (88).[29]

(88) a. Musa bé etsi (yin) du kun zì CSVC
Musa come yam PRT cook sell PURP
'Musa came to cook the yam and sell it.' (*with *zi* before 'cook')

b. (?)Musa bé nangi wan zì ya tsigbè. PSVC
Musa come goat catch PURP give medicine
'Musa came to catch a goat to give it medicine.' (*with zi after 'medicine')

This shows that the AspP2 of the PSVC right-adjoins to the phrase headed by *zì* (or perhaps higher). In contrast, the vP2 of a CSVC right-adjoins lower, to the vP selected by *zì*.[30]

This same structural distinction is revealed by adverbs in Nupe. Somewhat surprisingly, verb-phrase-final adverbs and unselected PPs in Nupe seem to be generated in a different position from their

[29] *zi* also must come after the second verb of an RSVC. This is expected, given that the VP2 of an RSVC is the complement of V1.

[30] Edo also has a head-final particle that is plausibly an Asp, the perfect particle *nè*. As expected, this *nè* always comes after the verbP2 of a CSVC (or an RSVC) in Edo. Unfortunately, the relative word order between *nè* and the verbP2 of a PSVC in Edo is not so clear; the examples we have checked are fairly bad with both word orders. Perhaps *nè* is semantically incompatible with a purpose phrase for some reason.

counterparts in Edo. In Edo, we assumed that they were adjoined to VP or vP, but this cannot be the case in Nupe. For example, adverbs come after the *zi* in the purposive construction, not before it:

(89) Musa bé nakàn (yin) ba zì sanyin
Musa come meat PRT cut PURP quietly
'Musa came to cut the meat quietly.' (* with *zi* after 'quietly')

Thus, Nupe adverbs adjoin to AspP or higher. Since Nupe adverbs attach so high,[31] they do not distinguish RSVCs from CSVCs the way Edo adverbs do. In Nupe, an adverb can only come after the second verb of the CSVC, not before it:

(90) *Musa du cènkafa sanyin gi. CSVC
Musa cook rice quietly eat
'Musa cooked the rice quietly and ate it.' (OK with *sanyin* after *gi*.)

(Recall that the equivalent of (90) is good in Edo.) However, Nupe adverbs do distinguish CSVCs from PSVCs, because they can come before the verb2 of a PSVC. Thus, (91) contrasts minimally with (90).

(91) Musa wan nangi sanyin ya tsigbe. PSVC
Musa catch goat quietly give medicine
'Musa caught the goat quietly, to give it medicine.'

This shows that the verbP2 of a PSVC adjoins to the same relatively high node that adverbs do (AspP), whereas the vP2 of a CSVC adjoins lower, to vP1.

The fact that the verbP2 of a PSVC adjoins to AspP (or higher) correlates with the fact that the verbP2 of a PSVC itself contains an Asp. Similarly, it is unlikely to be a coincidence that the verbP2 of a CSVC is a vP that adjoins to vP. This pattern suggests the following generalization:

(92) The category of the adjunct matches the category of the phrase it is adjoined to.

[31] Note that the VP-final adverbs in Edo and Nupe are not identical in meaning. The canonical VP-final adverb in Edo is *egiegie* 'quickly' and its various synonyms and antonyms. However, 'quickly' and 'slowly' are not VP-final adverbs in Nupe; canonical Nupe adverbs are 'quietly' and 'always'. Thus, it might still be possible to hold the view that the attachment site of an adverb is predictable from its meaning, as in Cinque [, 1999 #554].

The analysis of *ya*-purposives in Edo that was sketched in section 6.1 provides a third instance of this generalization: *ya*-purposives seem to be TPs that adjoin to TPs.

Now, why should (92) be true? We have already emphasized several times that adjunction is limited by the need to have a valid LF interpretation. We have assumed that predication is a mode of licensing that can in principle fulfill this requirement. Now, how are predication structures interpreted semantically? For most of the paradigmatic predication structures discussed in Williams 1980, the answer is that they are interpreted conjunctively: the predicate and its subject become two predicates of the same variable at the semantic interface. Thus, a relative clause like *the man that I saw* is interpreted as *the x [man(x) & I saw (x)]*. Similarly, a depictive secondary predicate like *I ate an oyster raw* is interpreted as ∃*x [oyster(x)] [I ate (x) & raw(x)]*. This seems to be quite general. Indeed, the Neo-Davidsonian program treats most adverbs and PPs—which are also adjuncts syntactically—as predicates of events, linked semantically to the interpretation of the verb projection by conjunction (see [Parsons, 1990 #395] among others). A conjunctive interpretation seems right for SVCs too. For example, a CSVC like *Òzó lé èvbàré ré* ('Ozo cook food eat') entails both that Ozo cooked the food and that Ozo ate the food. Suppose that we elevate this observation to the status of a general principle:

(93) Adjuncts licensed by predication are interpreted as conjoined with the XP they are adjoined to.

Now (93) gives us a way of accounting for the generalization in (92). In general, two expressions can be interpreted as conjuncts only if both expressions are of the same semantic type; either both must be predicates of entities, or both predicates of events, or both correspond to truth values, and so on for whatever semantic types there are. Otherwise, the conjunction will be meaningless—either incoherent or with no chance of being true, because there could be nothing that could satisfy both descriptions. This is summarized in (94).

(94) XP and YP can be interpreted as conjuncts only if they correspond to the same semantic type.

This principle is familiar from studies of explicit conjunction that involves *and* and similar particles, but its basic logic is more general. The last premise that we need is (95). This is familiar from studies on the lexicon and learnability, such as Grimshaw [, 1981 #659] and Pesetsky [, 1982 #523].

(95) There are general correspondences between semantic types and syntactic categories that are the Canonical Structural Realizations of those types.

Now, from the premises in (93), (94), and (95), we can infer (96), a slightly more general version of (92).

(96) XP can be an adjunct predicated of YP only if XP and YP are comparable syntactic categories.

This gives us a general schema for deriving the correlations between the internal structure of the verbP2 and its attachment site.

Of course, in order to sharpen this analysis, it will be necessary desirable to fill in exactly what are the semantic types that (94) refers to, and what exactly are the correspondences between those types and the syntactic categories that (95) refers to. We need these correspondences to be tight enough to constrain adjunction in substantive ways, but loose enough to allow some flexibility beyond an exact match. For example, in Edo a DP can be an adjunct predicated of a DP as in the *ne*+A construction mentioned in footnote 22, but a CP can also be predicated of a DP, as in normal relative clauses. Presumably, this is possible because CPs are similar to DPs in that they can refer to individuals, as shown by headless relatives like *I bought what you suggested*. For SVCs, fleshing out the analysis would involve taking a precise stand on what semantic type is expressed by vPs, and how this is changed into a different semantic type by Asp heads.

While doing this properly is beyond our grasp for now, we do have a something of an idea to offer in this connection. We suggest that Asp heads perform the function of mapping predicates of small-scale, semantically primitive events onto predicates of large-scale events that contain the primitive events as proper subparts. The view that verb roots characterize smaller-scale events than whole sentences do is inspired by Pietroski's [, 1998 #662] semantic analysis of transitivity alternations like (97).

(97) a. The water boiled

b. Chris boiled the water.

Pietroski argues that since (97b) entails (97a), it is desirable to say the transitive boiling event includes the intransitive boiling event as a proper subpart. However, the transitive boiling events also includes more: since Chris is the agent of the transitive boiling event, that event must include some action of Chris's

(such as turning a dial on the stove). Thus, the events being described by the *sentences* in (97a) and (97b) are different. Nevertheless, the verb root is the same in the two sentences. This suggests that *boil* itself expresses a smaller event than the sentence that contains it, at least in (97b). This points to the semantic representation of (97b) being something with the general form in (98).

(98) ∃e [Agent(e, Chris) & … & ∃f [boil(f) & part-of(e, f) & Theme(f, the water) ]]

Indeed, this distinction between the small-scale events introduced by verb roots and the large-scale events characterized by whole clauses is crucial to a semantic understanding of CSVCs. Semantically speaking, a CSVC characterizes a single large-scale event (corresponding to the single clause) that contains two distinct small-scale as proper subparts. Thus, (99) is a good first order appoximation to what a typical CSVC like *Òzó gié!gié lé èvbàré khién* (Ozo quickly cook food sell) actually means.[32]

(99) ∃e [Agent(e, Ozo) and quick(e) & ∃f [cook(f) & part-of(e, f) & Theme(f, $food_i$)]

& ∃g [sell(g) & part-of(e, g) &Theme(g, $pro_i$)]]

In light of this distinction, it is natural that there be some kind of clause-internal operator, distinct from the verb root, that creates predicates of big events. The idea that Aspect is this operator is suggested by sentences like (100) from Edo, which contains an overt Aspect head, the iterative morpheme *ghá*.

(100) Òzó gié!gié ghá lé èvbàré (khién).

Ozo quickly ITER cook food sell.

'Ozo quickly repeatedly [cooked food (and sold it)].'

Iterative *ghá* appears at the same general level of structure as the Aspect heads *zì* and *nè*: (i) it is higher than v but lower than T; (ii) like Nupe *zì,* it takes scope over both verbs in a CSVC; (iii) adverbs can

[32] One specific virtue of (99) is that it captures the fact that 'Ozo cook food sell' means more than just the conjunction of 'Ozo cooked food' and 'Ozo sold the food.' Rather, the cooking and the selling must be parts of a unified plan on the part of Ozo. If Ozo cooked food intending to eat it, and then a passer-by unexpectedly made him a monetary offer that he couldn't refuse, then 'Ozo cook food sell' would not be appropriate. This is a robust effect, valid also for CSVCs in Nupe and Edo. (99) captures this by saying that there must be a single coherent event that subsumes the two little events, and Ozo is the agent of that big event (not merely of the two subevents). Preverbal adverbs like *giegie* 'quickly' when they appear before a CSVC are also interpreted as predicates of the big event rather than of one the subevents.

attach to its projection. Also, it is relatively clear what *ghá* does semantically: it takes a predicate of small-scale, atomic events (individual cookings of food) and makes it into a predicate of big events that contain multiple instances of that small event (i.e., series of cookings of food). It is reasonable to conjecture that this is the function of Asp nodes more generally—including the semantically unmarked and phonologically null instances of that node found in any simple sentence. Then vP is the Canonical Structural Realization of a little event, and AspP is the Canonical Structural Realization of a big event, in the terminology of (95). Finally, suppose that we can maintain that the domain of "big events" is disjoint from the domain of "small events". Then, the conjunction of a predicate of small events with a predicate of big events could never be true. This would imply that AspP cannot be adjoined to vP, nor can vP be adjoined to AspP, as desired. Of course there is much to do to spell out exactly what is meant by "big events" and "small events", and what the semantic relationships between them can be. However, we hope that these conjectures are enough to give some substance to our suggestion about why the vP2 of a CSVC adjoins to a different category than the AspP2 of a PSVC.

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There are other semantic properties of CSVCs that refinements of (99) should capture. For example, the two vPs must be strictly ordered in time. Pietroski (2000) suggests that perhaps the predicates "f is part of e" in (99) should be replaced by more specific mereological predicates such as "f initiates e" and "e terminates in g".