Why are depictives different from resultatives?[*]

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Abstract

We analyse all of serial verbs, quasi-serials, depictives and resultatives as complex predicate structures semantically headed by the two-place asymmetric conjunction operator $. This uniformity necessitates an account of the fact that not all these $P behave in the same way. Our analysis exploits (1) EVENTS, where some $P encode single-event structures, and some multiple event structures, and (2) parametric differences associated with the $ head. In addition we exploit (3) the notion of 'nil roles' and their case properties, and (4) iconicity at LF. Our evidence comes from English, Dutch, Nupe and Korean.

1 Introduction

We have argued that all of resultatives, depictives, and quasi-serials in languages like English, and serial verbs under their various interpretations, have essentially the same structure (Cormack and Smith 1994, Cormack and Breheny 1994).[1] The parallel between resultatives and serials is taken up by a number of authors, including Seuren (1990: 20) and Collins (1997). However, Hoekstra (1988) and Bowers (1997) and others supporting the 'Small Clause' analysis of resultatives, Carrier and Randall (1992), and Neeleman (1994: chapter 4), have argued for, or must assume, distinct structures for depictives and resultatives.[2] The grounds for arguing explicitly for distinct structures for some pair of these complex predicates are differences of acceptability or syntactic

[*] This is work in progress. We would be grateful for comments, addressed to neil@ling.ucl.ac.uk or annabel@ling.ucl.ac.uk. We are very grateful to HyeKyung Kang, Soowon Kim, Ahmadu Ndanusa Kawu and Ad Neeleman for data and help. Ad Neeleman is responsible for the occurrence of this paper. They are not responsible for our arguments or conclusions.

[1] Syntactically, our analysis is closest to those of Larson (1991) or Bowers (1997). See also Déchaine (1993: chapters 3, 4).

[2] Legendre (1997) rejects such a difference for French, arguing that resultatives like depictives must be adjuncts.

behaviour. Our aim in this paper is to defend our uniform, and parsimonious, analysis by showing that it offers a natural means of differentiating between structures which should be differentiated.

The issues which we need to address are the following.[3] Why do depictives behave unlike resultatives in Dutch with respect to incorporation? Why do few languages have subject-orientated resultatives? Why can't 'fake object' structures have a depictive interpretation in English?

The answers we will provide depend on the interaction of general principles with language-specific options. The general principles concern the properties of 'adjunction' structures, and the syntactic formation of certain complex predicates: see sections 2 and 3. The language specific options concern the parameters associated with the generalised asymmetric conjunction head $ (section 2), and the specification of thematic-role changing operators in a particular language (section 4.2 and later).

There are numerous related matters which we will not be treating at all in this paper. One is the PF order in which items appear. Where there are discrepancies between the LF structures which we suggest, and the required PF order, the reader is asked to assume that some legitimate displacement of a head or a projection of a head will provide the right order.

The structure of the paper is as follows. In sections 2, 3, and 4, we introduce the structures underlying our theory of depictives, resultatives, and serial and quasi-serial structures, and make some further hypotheses. In sections 5, 6, and 7, we use this apparatus to account for many of the interesting differences between these various structures, and between their occurrences in various languages. We concentrate particularly on the Dutch (in response to Neeleman (1994), and Korean, stimulated by Kim and Maling (1997, 1998). In section 8, we discuss the internal structure of events, and show how this explains some of the hypotheses we made earlier.

2 Adjunction structures

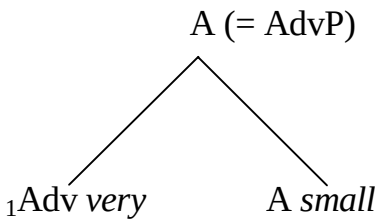
We have argued elsewhere (Cormack and Smith 1994, Cormack 1999) that adjunction structures are headed by one- or two-place syntactico-semantic operators, which select

[3] Most of these differences in behaviour of resultatives and depictives have been noted or discussed by others (see for instance Tenny 1994; Carrier and Randall (1992)). There are other real or alleged differences which we have not treated here: the restrictions on the occurrence of resultatives with triadic verbs (Kim and Maling 1998: 11); the occurrence of middles (Tenny 1994:154); partial extraction from NP (Kayne (1985), answered in Carrier and Randall (1992: section 4), and extraction of the adjunct predicate, Chomsky (1986:83), answered in Kuno and Takami (1993, sections 9, 10).

for their operand(s). The final operand is the host category. Unlike lexical heads, operator heads project not their own category, but rather that of the host. The operators with which we are concerned are non-binding operators (unlike say determiners, which bind open places in their operands).

An example of a one-place operator is *very*. *Very* may take as its sole operand an adjective (A), and the category of the mother will also be A, as in (1). An example of a two-place operator is *if*. Typically, *if* selects for two clausal operands, yielding a clause, as shown in (2). Where X is an operator, we use 'XP' informally to indicate a projection at which X is saturated.

(1)



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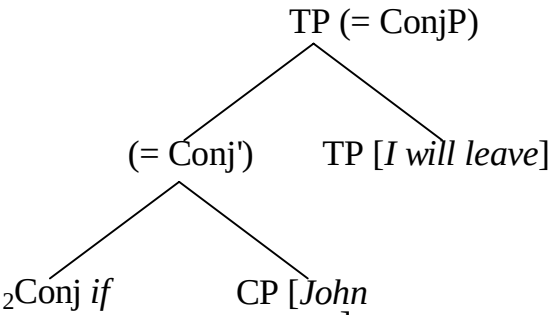


Semantic operators canonically take one or more operands of semantic type <t>, and output type <t>, where <t> is the type for a proposition. Thus for instance the *if* in (2) has type <t/t/t>.[4,5] However, typically these one- and two-place operators are freely polymorphic with respect to operand type, having type <α/α> or <α/α/α>, so that for

[4] We use a notation here parallel to that for categories, where the types of the arguments or operands are placed after the mother type, and are marked as selection features by slashes. The first argument or operand to be used is the outermost (last) one.

[5] Throughout, simplified types are used, with event arguments and others omitted, and with the assumption in most cases that all internal arguments of lexical heads are of type <e>.

instance the *very* in (1a) will have a type <α/α> where <α> = <t/e>, the type for a one-place predicate.

If the combinatory operations permitted at Merge are restricted to function-argument application **A**, then semantic operators of the types <α/α> or <α/α/α> can legitimately combine with their operands only if the operands have type <α>. However, we assume that semantic operators are also allowed to combine using function composition **B** (Steedman 1993). What this means is that the host category may be less saturated than the chosen type <α>; the effect is that the adjunct phrase (the operator and the first operand) may be merged at a position lower in the tree than would be possible if only **A** were available. Examples like (3a), where there is bound variable binding from the object into the *if*-adjunct, are thus accounted for.

(3) a The teacher will reward each pupil if he does well
b The teacher will [each pupil [[if [he does well]] reward]]

The LF order is as in (3b); the adjunct has type <t>, and the host, the transitive verb, type <t/e/e>. The semantics of **B** ensures that *reward* is assigned its correct arguments while allowing the object np to have scope over the *if*-adjunct.[6]

3 $P

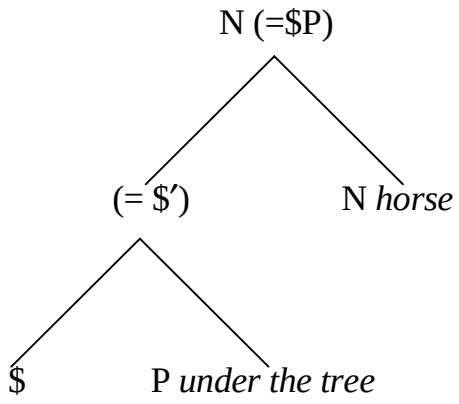
In earlier papers, we have argued that as well as coordinating conjunction, which displays symmetric syntactic behaviour with respect to its two operands,[7] natural languages utilise an asymmetric conjunction, $. It is well-known that the coordination head, &, is often phonologically null (Payne 1985). The same is true of the $ head. In English, for example, a null $ head mediates the adjunction of modifiers to nouns, as shown in (4). We assume for English that $ is head-initial, and that $ attracts one of its operands according to a rule which ensures that unless the first operand is an A^0 adjective, the noun is attracted.[8]

[6] **B** [if [he does well]] . [reward] = $\lambda y\, \lambda x$ [if [he does well]] . [reward].*y*.*x*]

[7] There may be asymmetries in for example plural-marking or case-marking. See Johanesson (1998), and Corbett (1991:265), though some of their examples may relate to asymmetric conjunction.

[8] A^0 adjectives include adjectives with X^0 operator adjuncts, such as *very*.

(4)



The semantics induced by the $ conjunction with operand types <t/e> will correctly give the mother the meaning λx [HORSE $x \wedge$ UNDER-THE-TREE x]. The $ head may be overt in some environments in English, appearing as *and* in quasi-serials; in other languages, for instance Tagalog, it may be overt in noun modification (Rubin 1996).

In this paper, we are concerned with $P where the host is V, and in particular, V^0. Consider for instance a depictive, as in (5). The reading we require can be paraphrased as 'John left the room and John was angry at the time', so that a structure with a $-head is plausible, perhaps as in (5b). However, as with the *if*-adjunct in (3), we may have a scope relation between the object DNP and the adjunct, as in (6), so that it must be possible to merge the adjunct at the V^0 level (contra Roberts (1988), Larson (1991)).

(5) a John left the room angry
    b John [$_{\$P}$[$ [angry]] [$_{VP}$ left the room]]
(6) a John left each room disgusted with the mess in it
    b John [each room [$_{\$P}$ [$ [disgusted with the mess in it][$_{V}$ left]]

Here, the first operand of $, *disgusted with the mess in it*, has type <t/e>, and the host V *left*, <t/e/e>. $ of the appropriate type (<α/α/α> with α= <t/e>) will combine by **A** with the first operand, and then by **B** with the second. The semantic effect will be to assign the argument JOHN to the external role of the AP.[9] This effect will be important later.

[9] The $ head will have semantics $\lambda P \lambda Q \lambda x$ [P$x \wedge$ Qx]. Applied to the AP [DISGUSTED …], this yields $\lambda Q \lambda x$ [[DISGUSTED …$x \wedge$ Qx] of type <<t/e>/<t/e>>. When this is combined with the V^0 [LEFT] of type <t/e/e> by **B**, we obtain $\lambda y \lambda x$ [[DISGUSTED …$x \wedge$ LEFT x y]; the AP is subject-orientated.

Further evidence for adjunction at the V^0 level is given by the possibility of Dutch impersonal passives. In Dutch, certain unergative intransitive verbs may be passivised. In (7), there is also a subject-orientated depictive.

(7) a Iedereen zwemt naakt in dit meer
everyone swims naked in this lake
b In dit meer wordt naakt gezwommen
in this lake is naked swum
'people swim naked in this lake'

In (7b), the $-conjunction with *naakt* as its first operand cannot be at the VP level, since this would entail that *naakt* was predicated of the phonologically null expletive subject. The only possible derivation has *naakt* conjoined to the V^0 verb *zwemmen* before passivisation, so that it will be predicated of the external argument of *zwemmen*, suppressed under passivisation.[10]

We note with respect to the $ head that as a minor head, several parameters may be associated with it, including phonological shape, headedness, and selection properties. $ might be head-initial or head final, or possibly head-medial. It might vary in phonological shape according to the categories it selects. It might be restricted to certain semantic types.

We turn now to serial verb structures; we come back to resultatives later.

4 Serial structures and events

4.1 Serial verb structures and iconicity

We claim that a serial structure in the broad sense is one where two verbal projections are $-conjoined, with the $ head being phonologically empty, and with the verbs having at least a shared subject. This characterisation excludes both subordination and auxiliary structures, but does not distinguish between a looser sense, and the tighter one (Serial Verb Construction – SVC – proper) where the two verbs combine to describe what is being characterised as a single event (see section 4.3).

[10] Bresnan (1982) notes that in Norwegian and Icelandic, sentences like (7b) are ungrammatical. We assume that in these languages, the Passive operator requires not just an unergative input, but a V^0 one.

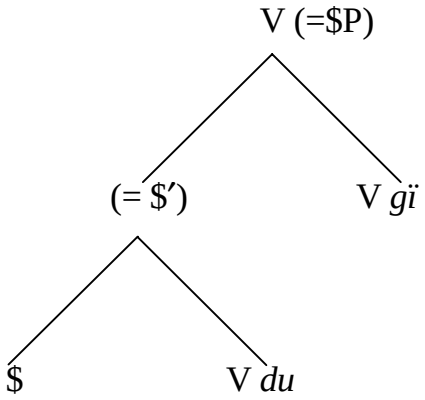
The prototypical serial verb structure contains two verbs in a single clause, where the two verbs share subject and object, as in (8) and (9), which are from the Kwa language Nupe.[11]

(8) Musa **du** eci **gï**
Musa boil yam eat
'Musa boiled and ate the yam'

(9**)** Musa á eci **du** **gï**
Musa Perf yam boil eat
'Musa has boiled and eaten the yam'

We postulate that the underlying LF-interpretable structure is a $P with V^0 operands as in (10); the PF order in (8) is obtained by movement of the first verb to T across the object (see Cormack and Smith 1994).

(10)



The proper interpretation requires that the two events given by the verbs happened in sequence, with the PF and perhaps the underlying LF orders being iconic with respect to the temporal order. The sequential 'and then' interpretation is not explicitly coded in the $ head, but is obtained pragmatically, just as it is in the case of the glosses given for (8) and (9). As with English *and*, we may also obtain "simultaneous" interpretations, and cause-effect (resultative) interpretations. Both these, like sequential interpretations, must have the verbs in iconic order at PF (and perhaps LF) if applicable, where iconic order is

[11] For further discussion of Nupe serial verbs, see Cormack and Smith (1994) and references therein. The diacritics indicate tone: *ó*, high tone; *ò*, low tone; *ö*, rising tone; *ô*, falling tone; mid-tone is unmarked.

the mimicking in linear order of the order given by conceptual priority. For the "simultaneous" interpretation, iconicity will be relevant when the two events are Processes where one is carried out for the purpose of facilitating the other, as in (11).[12] For a cause-effect reading, the cause linearly precedes the effect at PF, as in (12). We claim that it is not necessary to assume that any CAUSE head or BECOME head is inserted into the structure at any level, to obtain the correct readings (see Wunderlich 1997: section 2.3). The reading follows either pragmatically, as an explicature based on the conjunction head $, or from the semantics of $ together with the internal structure of an event (see sections 4.3 and 8.4).

(11) a u dákàkà gí nyagíci
he sat eat food
'he sat and ate the food'
b John sat and ate his meal

(12) u wu nankó nìkîn[13]
he beat cow fall
'He knocked the cow down'

4.2 The operator Nil1

One of the striking properties of serial verb structures is that it is possible for one of the verbs to be intransitive, while allowing the object of the other to be extracted. Thus (13) and (14) are well-formed, just as the parallel English quasi-serials and resultatives in (15) and (16) are.

(13) kî u dákàkà gí o
what he sit eat
'what did he sit and eat ?'

[12] The temporal relation is not strict simultaneity, but is more probably overlap. Throughout this paper we largely ignore the details of temporal relations.

[13] This example is from Solomon Yisa. Ahmadu Kawu rejects this, requiring *u wu nankó á nìkîn* (ungrammatical for Yisa), and obtaining only the subject-orientated reading, 'He hit the cow and fell down'.

(14) kî u wu nìkî nyi o[14]
what he beat fall (nyi) FOC
'What did he knock down?'
(15) What does John sit and read all day?
(16) What did John paint red?

From what we have said in section 2, there are just two ways in which this could occur. First, it would be possible for the first operand of the $ head to be of type <t/e>, and the second of type <t/e/e>. The object is the complement of the complex $P, and hence would be extractable. However, as noted there, the intransitive <t/e> predicate has the subject as its sole argument, so that this will not produce a solution for object-orientated resultatives. Second, the intransitive may be conjoined with the VP of the transitive, with both $ operands now of type <t/e>. Provided that the VP is the host, this would again allow extraction of the object; but again, the intransitive is necessarily predicated of the subject, leaving object orientated resultatives unaccounted for.

We need a solution compatible with our $ conjunction analysis. It is well-known that the intransitive in such serial verb structures can only be unaccusative. We proposed in Cormack and Smith (1994) that unaccusatives may have their single 'real' role internal, so that it will be associated with the object argument, while deploying an external role which is "nil" — that is, the external role contributes nothing to the meaning postulates associated with the unaccusative. A "nil" role is a kind of place-holder in the ordering system for arguments, like zero in a numeration system. By this means, the unaccusative will have the type <t/e/e> allowing $ to have both operands at the <t/e/e> level. For clarity, we show the type for the unaccusative as <t/nil/e>.

We propose that the <t/nil/e> type is obtained from a basic (Language of Thought) <t/e> type by means of a syntactico-semantic 1-place operator designated Nil1. The operator vacuously lambda abstracts over the external argument position.

(17) For any predicate P, Nil1 (P) $\equiv_{df} \lambda y \lambda x\ P y$

Associated with such an operator is the range of lexical items which constitute its proper input. The range of verbs which is unaccusative varies parametrically from language to language, with each language choosing a dividing point along the unaccusative/unergative gradation (Sorace 1999). We extend the distinction to include

[14] The presence of *nyi* is phonologically conditioned. (See Smith (1967:51)).

prepositions, adjectives, and nouns. Most of these represent STATES, which we hypothesise are always unaccusative.

(18) Hypothesis I: STATES are unaccusative

Nil 1 applies only to unaccusatives. Thus in particular, we postulate that the verb *nìkî* 'fall' in Nupe, and the adjective *red* in English are within the range of Nil1. Let us refer to $ whose operands are <t/e/e> (where the type shown as <e> may be nil) as conjoining at the <t/e/e> or transitive level, since it conjoins two transitive categories. If Nil1 is applied to the unaccusatives, this will ensure that the $-conjunction of *nìkî* 'fall' and *wu* 'beat' at the "transitive" level is well-formed and assigns the real (Language of Thought) role of *nìkî* 'fall' to the object noun phrase *kî* 'what' in (14). It will likewise entail that the $-conjunction of *paint* and *red* at the transitive level is well formed and assigns the real role of *red* to the object, as required for the resultative in (16).

(19) a [[[$ [Nil1 $\text{FALL}_{<t/nil/e>}$]] $\text{BEAT}_{<t/e/e>}$]
b [[[$ [Nil1 $\text{RED}_{<t/nil/e>}$]] $\text{PAINT}_{<t/e/e>}$]

It is worth noting that the combinators and the Nil1 operator permit an intransitive included in a $P to assign its sole real role to the subject (as discussed in section 3), or to the object (by conjoining at the <t/e/e> level), but not to any other argument. That this is true of English is well-known (Levin and Rappaport Hovav 1995: 34).[15] However, Kim and Maling (1997, 1998) argue that it is not true for Korean, giving examples like the following, where they claim that the resultative is predicated of the dative oblique object:

(20) Kim-i tali-ka hwui-key umsik-ul sang-ey ollynoh-ass-ta
Kim-N legs-N bent food-A table-DAT pile/put-Pst-Ind
'Kim piled food on the table [so that its] legs [became] bent'

We think this is a misinterpretation of the data. The phrase [*tali-ka hwui-key*] 'bent legs' is not PREDICATED OF the oblique object *sang-ey* 'table': it is simply naturally interpreted as having what we take to be its internal argument *tali-ka* 'legs' construed as

[15] If this is correct, then in ditransitives like *John gave Mary the book open, the book* must be the direct object. This is consistent with the observation that *John gave Mary the book sober* is unambiguous.

pragmatically related to the oblique object by possession. Its head *hwui-key* 'bent' will have a type <t/nil/e>; the nil role will be predicated of the subject. This example will be discussed in more detail in section 6.4.

We will see in section 7 that a language may exploit another operator, Nil2, which derives a 2-place predicate of type <t/e/nil>, typically from one of type <t/e/e>. This is implicated in 'fake object' resultatives and in English quasi-serials. We postulate that Nil2 applies only to transitives and unergatives.

4.3 Serial verbs and the 'single event' reading

In most serialising languages, a distinction is made between true SVCs and other structures which are often argued to result from covert coordination (Baker 1989, Collins 1997: 466). We argue that it is possible for non-SVC structures to be instances of $ conjunction.

SVCs have two properties which are important to us here. First, native speakers regularly claim that an SVC is only well-formed if the sub-events of which it is made up can be construed as part of a 'single event' (see for example discussion in Hale (1991: 23ff).[16] Second, the two verbs making up the serial predicate function as a quasi-lexical-item, and frequently have non-compositional meaning.[17] We put forward the hypothesis here that these two properties are related. For brevity, we use the terminology 'X^0 $P' to refer to a $P which is the $-conjunction of two lexical heads. The terminology is meant to convey the fact that the $P has many of the properties of a single lexical item. In particular, it has the selection properties and event structure appropriate to a lexical item. Similar properties seem to hold in English. Levin and Rappaport Hovav (1995: 55) say of the analysis of resultatives: "The analysis falls out from the natural assumption that the eventualities created by the composition of predicates can only belong to a type for which there are underived lexical items."

Suppose then we have a $P whose host is a projection of V.

(21) Hypothesis II: A phrase with V^0 $P represents a single event
Hypothesis III: A phrase representing a single event has V^0 $P

[16] We use 'event' here in the most general sense, where it covers for instance States as well as Processes.

[17] Serial verbs frequently have monomorphemic lexical equivalents in other languages, for example Nupe *gò-sàn* 'receive-imitate': 'interpret'

In section 8, hypothesis II is derived rather than stipulated. The addition of Hypothesis III is a natural strengthening of Hypothesis II from a conditional to a biconditional.

As an example, consider the Ewe sentence in (22). Collins (1997) showed that a sentence like (22) has a true SVC reading (i.e., according to our hypotheses, a V^0 \$P structure) under the object resultative or object-orientated sequential reading, but not under a reading where the intransitive predicate is subject-orientated. This is reflected in the congeneric future versions of these sentences. As shown in (23), for the object orientated resultative reading, there may be just a single instance of Future marking *a*, but for the subject orientated reading, two instances of the future marker are required.

(22) ekpe *f*o kɔpo yi xɔ-me[18]
rock hit cup go room-in
'a rock hit a cup into the room' *or*
'a rock hit a cup and then went into the room'

(23) a ekpe a *f*o kɔpo yi xɔ-me
rock FUT hit cup go room-in
'a rock will hit a cup into the room'

b ekpe a *f*o kɔpo a yi xɔ-me
rock FUT hit cup fut go room-in
'a rock will hit a cup and then go into the room'

We will argue below that both the non-existence of V^0 \$P subject orientated resultatives and the absence of V^0 \$P depictives is due to constraints on the internal structure of a linguistically realised event (see sections 8.3 and 8.4).

Two events can legitimately be construed as sub-events of a single event if they are associated in some suitable way (Awóyalé (1988), Durie (1997: 326, 3.4), Sohn (1994: 71, 119 re *-e*(*se*))). One such association is regular occurrence in sequence as part of some purposeful activity, such as *cooking* and *eating*. The cause-effect relation is another relation which legitimises the construing of two sequential events as one.

The primitive events are PROCESS and STATE, which may combine to form a more complex entity. A CULMINATED PROCESS is an internally complex event, consisting of a Process and a State, where the State must be "Consequent State" in relation to the Process.[19] A \$P which represents a 'single event' must according to the hypotheses

[18] Tone marking is not shown,

above be such that its internal structure is compatible with one of these categories of event. An intransitive resultative may straightforwardly be seen as consisting of a Process and a State, which yield a complex interpretable as a Culminated Process, as in *freeze solid*. Transitive resultatives may consist of a Culminated Process and a State, as in *paint (the house) red*. We predict then that resultatives may constitute the (complex) predicate of a single event.

Under this conceptualisation, some serial cause-effect $P, such as (24) are resultatives. That is, the first verb describes a Process and the second, a State, which can be construed as a Consequent State.

(24) ó pón rà (Yoruba, Baker 1989: 533)
it ripen rot
'it has ripened to the point of rotting'

When we turn to depictives, such as *drink (the coffee) hot*, we still have a State and a Culminated Process. But the State is not a Consequent State, so that the complex does not fall under any of the possible categories of event. This entails that depictives, unlike resultatives, can never head single events (see Tenny 1994: 153, for essentially the same conclusion, though curiously she expects syntax to differentiate the readings; the finding is contra Rapoport (1991:174) who suggests that adjunct predicates are associated with their host by virtue of event-sharing).

The serial verb and quasi-serial structures interpreted as sequential are cases where the two sub-events can be seen as sub-processes of a Process, as in *run and jump*. If the temporally second sub-process is culminated, then the complex Process will be culminated. Consider quasi-serials with an initial intransitive, like (25) and (26).

(25) Pat ran and fetched the paper
(26) Lucy sat and read a book

We consider these motion and posture verbs *run* and *sit* to represent Processes which like States, are internally undifferentiated.[20] In these examples, the two Processes

[19] Plain and Culminated Processes may be either extended in time or momentary, but this dimension is not important to us here. As is well-known, the definiteness of the object and other matters can affect the aspectual status of the vp. We abstract away from this, assuming that the default aspectual status is as indicated, with compositional processes or coercion accounting for alternatives.

[20] *Sit* describes a relatively static activity, but not a State, at least when predicated of a person who is undertaking the activity voluntarily. States proper are not under voluntary control (as opposed to the

represented by the verbs occur simultaneously, up to the culmination, taking the culmination offered by the second verb as the culmination of the complex event. The connection between the two Processes that licenses the single event interpretation is that the initial Process facilitates the Culminated Process.[21]

5 Dutch: incorporation processes

In this section, we begin to use the apparatus we have set up to answer the questions about differentiating resultatives and depictives. Our first question concerns Dutch. Neeleman (1994: Chapter 4) gives evidence that resultatives and depictives behave differently from each other in Dutch. He uses this evidence to argue that in consequence, they must have differing syntactic structures: resultatives are produced by Complex Predicate formation rules, while depictives rely on construal of predication in adjunction structures. We want to show here that both can be formed by projecting a $P; a separate notion of 'predication' is not required. The difference derives from the differing associated event structures.

Neeleman and Weerman (1993) and Ackema and Neeleman (1999: section 3) show that we cannot have a solution to the problem of representing the differential behaviour of resultatives and depictives based on the fact that resultatives (but not depictives) could be produced in the morphological component, and 'count as' words. Accordingly, Neeleman (1994: 115-116) offers distinct syntactic structures for depictives and resultatives. However, we suggest that the difference derives only from the fact that for independent reasons, to be spelt out below, resultatives may, but depictives may not, form V^0 $P in languages like Dutch.

The differences in behaviour concern V-to-V raising, illustrated in (27) and (28), and P-incorporation, illustrated in (29) and (30). With respect to these processes, a resultative $P, but not a depictive (also a $P, according to us), acts like a simplex verb, and allows the relevant incorporation. Examples from Neeleman are given in (27) to (30), where (27b) contrasts with (28b), and (29b) with (30b).

(27) a Dat Jan [de deur groen t_i] wil verven$_i$

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inchoative congener). In any case note that *sit*, even when not controlled by an agent is capable of being used in the progressive, where classic States like *know* are not.

[21] Note that the rationale for associating two events as subparts of another overlap with the conversational desiderata for speaking of one event in connection with another. See Moens and Steedman (1988: 16); Awóyalé (1988).

that Jan the door green wants to-paint
b Dat Jan [de deur t_i] wil [groen verven$_i$]
that Jan the door wants green to-paint

(28) a Dat Jan [Marie naakt t_i] zal onmoeten$_i$
that John Mary nude will meet
b *Dat Jan [Marie t_i] zal [naakt onmoeten$_i$]
that John Mary will nude meet

(29) a (De kwast) **waar**$_j$ Jan de deur [t_j t_i] groen [**mee**$_i$ verfde]
the brush that John the door green with painted
b (De kwast) **waar**$_j$ Jan de deur [t_j t_i] [**mee**$_i$ [groen verfde]]
the brush that John the door green with painted

(30) a (De tuin) **waar**$_i$ Jan Marie [t_j t_i] naakt [**in**$_i$ onmoette]
the garden that John Mary nude in met
b *(De tuin) **waar**$_i$ Jan Marie [t_j t_i] [**in**$_i$ [naakt onmoette]]
the garden that John Mary in nude met

We suggest that the processes of P-incorporation and V-to-V raising are complex head (=X^0) formation processes. As such, their inputs must be X^0 heads, either simplex or complex. Since depictives cannot form a single event, and a V^0 \$P is always part of a single event by hypothesis III, depictives cannot involve V^0 \$P.[22] This entails that they are excluded from these incorporation processes, as required.

It is important to note that contrary to what might be inferred from (28b) and (30b) any \$P, whether a V^0 \$P or not, may be displaced as a whole under 'head movement'. In English, this can be seen in 'Heavy NP shift' structures, as opposed to 'light NP' structures. We take this to reflect the choice of the higher V (=\$P), or the lower V, projection, to the relevant position preceding the object (as in the 'Light Predicate Raising' of Larson 1988). (31b) shows Light Predicate Raising for a V^0 \$P, a resultative, and (32b) and (33b), for \$P which are not a V^0 \$P, depictives.

(31) a Harry **painted** both his car and his van [$_V$ [\$ **red**] [$_V$ *t*]**]**
b Harry **painted red** both his car and his van [$_V$ *t* **]**

(32) a Lucy **drinks** both tea and coffee [$_V$ [\$ **cold**] [$_V$ *t*]**]**

[22] When event roles and quantification are introduced in section 8, we will see that a structure of the form [[\$ A^0] V^0] actually has two different possible types, corresponding respectively to V^0 proper (a V^0 \$P which is potentially a single event), or to a multiple event structure, which does not have the proper V^0 type.

b Lucy **drinks cold** both tea and coffee [$_V$ *t*]

(33) a John$_j$ **painted** both his mistress and his wife **drunk$_j$**

b John$_j$ **painted drunk$_j$** both his mistress and his wife

The grammaticality of examples like (33b) also provides further evidence that it is possible to have the subject orientated predicate adjoined at a V^0 level (section 0).[23]
It is only when incorporation is required, as in the Dutch examples above, that there is a restriction to V^0 \$P.

6 Subject-orientated resultatives

6.1 Introduction

In this section, we discuss subject orientated resultatives. It is frequently assumed that subject orientated resultatives are uniformly unobtainable across languages. As pointed out by Kim and Maling (1997, 1998), this is not true. We have two tasks, then: to explain why such readings are impossible in English (and many other languages), and to explain why such readings are possible in some different languages.

The absence of subject-orientated resultatives in English is explained in section 6.2 as due to the interaction of the head-initial position of \$ in English, and an iconicity requirement on the interpretation of multiple-event structures. We also discuss there some further consequences of our hypotheses.

Subject orientated resultatives in other languages may be well-formed for two main reasons: either \$ is head-final, or State predicates may be realised as verbs (which can make it possible to meet the iconicity requirement: section 6.3) In section 6.4, we discuss Korean serial and other resultatives and depictives in the light of these constraints.

6.2 Why are subject-orientated resultatives ungrammatical in English?

In English, as in a wide variety of other languages, including Dutch, subject resultatives are ungrammatical, although subject depictives, (and object resultatives), are

[23] Kuno and Takami (1993) take the existence of such examples as evidence against Larson's LPR. We disagree.

grammatical. Example (34) can only mean that John ate his supper while already in the state of being full; it cannot mean that he ate his supper and as a result became full.

(34) # John ate his supper full

Making the natural assumption that $ is fully head-initial in English, the relevant LF $P must be as in either (35a) or (35b), since the host projection must be V, rather than A.

(35) a [[$ [full]] [ate his supper]]
b [[$ [full]] [ate]].

Note that in either (a) or (b), the LF order is iconically suitable for a depictive, but not for a resultative. In a single event $P, the construal of a sub-event State as a Consequent State is mandatory. In a multiple-event $P, the relation of a sub-event State to a sub-event Process is underdetermined. Suppose then that in a multiple-event $P, iconicity at LF is necessarily used in determining the interpretation of the $P. We propose Hypothesis IV.

(36) Hypothesis IV: Multiple event $P are interpreted according to iconicity at LF

If $ is head-initial, then since the ordering at LF in (35) fails to support the iconicity otherwise required for a resultative, this requires a resultative to be a single event, and hence by hypothesis II, a V^0 $P. Then object-sharing is mandatory. However, we have already hypothesised that States may host Nil1, but not Nil2, so that the only transitive type available is <t/nil/e>: if *full* has this type, the real role is necessarily assigned to the object. The subject-orientated resultative reading is therefore unobtainable.

There is a further consequence of our analysis. If depictives cannot form V^0 $P (section 4.3), but resultatives must, we have an immediate explanation as to why there is a nesting constraint on the ordering of resultatives and depictives in English (Déchaine 1993: 150 ff).

(37) a Mary painted the room black drunk
b # Mary painted the room drunk black

A resultative must be construable as a single event, to obtain a V^0 $P, but a depictive necessarily includes more than one event (Hypotheses II and III). Then a depictive cannot be merged inside a resultative.

6.3 How are subject-orientated resultatives grammatical?

In English, our explanation for the ungrammaticality of subject orientated resultatives used the language specific information (i) that $ is head-initial and (ii) that States are realised as adjectives, not verbs. Under our hypotheses, then, there are two main ways in which a language might be able to escape from the restrictions leading to the absence of subject resultatives. First, the $ head might be final rather than initial. Second, the relevant State meanings might be instantiated as verbs, so that even if $ is head-initial, we may have Process-State order at LF. And of course, both these properties could hold of a language.

We are going to illustrate subject-orientated resultatives with Adjective States with Korean, which we will show to have head-final $ (section 6.4). However, we note here that Chinese, Japanese, Korean, Ewe and Nupe, and many other serialising languages, have subject-orientated resultatives where the State is described by a verb. An Ewe example is given by the second reading of (22) in section 4.3. Korean examples are given in section 6.4; Li (1993) also gives Japanese examples.

(38) Taotao zhui-lei-le Youyou LE (accents omitted) Chinese (Li 1993)
Taotao chase-tired-ASP Youyou PARTICLE
Taotao chased Youyou and as a result Taotao/Youyou got tired

(39) u gí nyagíci funîn Nupe
he eat food be-satisfied
'he ate the food till he was satisfied'

Suppose we assume Hypothesis I, that States are unaccusative, and take *lei* 'tired' in (38) and *funîn* 'be-full' in (39) to represent States. Then the $P cannot be V^0, because the State operand can only have the transitive type <t/nil/e>. This restricts us to configurations where the State predicate has first merged with trace, to give a VP of type <t/e>. Because we do not have a V^0 $P, there must be multiple events by Hypothesis III. By Hypothesis IV, the predicates must be iconic at LF, so that for a resultative, we must have one of the configurations in (40):[24]

[24] The two verbs must also be iconic at PF, but because the checking theory proposed by Cormack and Smith (1999) allows a head to be displaced from an adjunct, the 'movement ' of the initial verb in (40a) would be possible.

(40) a [[$ Process] State] b [Process [State $]]

We know of no language instantiating (40a), but there possibly are such. We discuss in the next subsection Korean, a language instantiating (40b). In any case, subject-orientated V-V resultatives will be grammatical unless other restrictions apply.[25]

6.4 Korean

Consider a language with head final $, where the two operands of $ are A and V.

(41) [V [A $]]

As argued in the last section, subject-orientated resultatives may now be possible. However, depictives of all kinds are precluded. They cannot occur inside $P, because $P forces a resultative interpretation. They cannot be occur as multiple event structures, because there will be a failure of iconicity. We show that Korean instantiates these properties, i.e. there are subject orientated resultatives, and there are no depictives.

Both subject-orientated and object-orientated readings may be obtained with intransitives of the kind traditionally designated as adjectives (Sohn 1994: 96, 1.2.2.2). These inflect, and can head independent clauses; they are sometimes assumed simply to be verbs.[26]

(42) a John-un Mary-lul ciluha-key ccochatani-ess-ta (Korean: Soowon Kim p.c.)
John-TOP Mary-ACC bored$_A$-KEY chase$_V$-PAST-IND
'John chased Mary so that he/she became bored'

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[25] There is one other possibility for subject orientated resultatives, which is that the heads that look as if they represent States somehow accept Nil2. This could be either because Hypothesis I is not universal; or because the apparent States are rather Culminated Processes, and these may be unergative. We set these possibilities aside for further research.

[26] The *-key* suffix is often assumed to be a 'result' suffix (Sohn 1994: 323, Kim and Maling 1998:194) However, we think that it is parallel to the *-e* inflection, being simply the 'adverbial'/infinitival form appropriate for adjectives (cf. the *-ku* 'continuative' suffix in Japanese, Kuno 1973: 28, and Cormack and Smith 1996: 267). We take the presence of this inflection to be an instance of the pervasive reduced inflection on all but one verb of a serial verb structure. That the meaning is not resultative is confirmed by the comprehensibility of depictive interpretations (examples (43) and (44) below).

In (42), the verb is at the end of the clause at PF. We assume rightward movement of V out of the $P, perhaps to T (Cho 1994), or to the $Infl^T$ associated with T (Cormack and Smith 1998).[27]

Depictives with inflecting adjectives are interpretable, but uniformly ungrammatical (HyeKyung Kang, p.c.), as can be seen in the examples in (43) and (44).

(43) ??John-un botong sul-e chuyhatssul-tte-man chum-ul chu-chiman,
John-nom usually alcohol-E drink-PAST-when-only dancing-acc dance-but,
ku-uy saengilnal-enun (chum-ul) onjeonha-key chu-ess-ta.
his-Poss birthday-on sober-KEY danced
'Usually John dances only when he is drunk, but on his birthday, he danced sober (without drinking/in the state of not drunken).'

(44) ??John-i mwulkoki-lul sinsenha-key mek-ess-ta (Jang 1997: 153 (15))
John-NOM fish-ACC fresh-KEY eat-PAST-DECL
'John ate the fish fresh'

Note that in the case of the subject orientated depictive, there is some doubt as to the conclusion to be drawn, because the *-key* suffix may also mark adverbs. The preamble to the depictive in (43) was intended to rule out the 'soberly' interpretation of *onjeonha-key*. Note also that although all our informants report that the object orientated depictive in (44) is at best marginal, it was given as grammatical by Jang (1997), who argues that *-key* items head predicates, rather than heading adverbial phrases as in the traditional description.

The availability of the object-orientated resultative in (42), and the comprehensibility of the object orientated depictive in (44) require that Nil1 is available for the Adjective heads. Adjectives reject the progressive: Sohn 1994: 332, so we assume they represent States as expected. Object orientated readings will require $ at the transitive level.

Subject orientated resultatives cannot be within V^0 $P, since Nil2 will not be available for States. They could in principle be under V^0, using the combinator **B**, or they could be $-adjoined higher in the clause. Resultatives of the kind discussed by Kim and Maling

[27] There is however a variant of (42) in which it is the adjective which is raised to the end of the clause, and bears the full tense marking, while the verb bears the 'consecutive' inflection: *John-un Mary-lul ccochatani-e ciluha-ess-ta.* (HyeKyung Kang). Such sentences only have the subject-orientated reading, so we assume that *-key* as in (42) is needed to licence Nil1 on the adjective.

(1997) and introduced in section 4.2, example (20), suggest that the result phrase may be adjoined anywhere in the VP. Further examples are given in (45) and (46).

(45) John-i chim-i malu-key Mary-lul chingchanhay-ss-ta
John-N tongue-N dry-KEY Mary-ACC praise-Pst-Ind
'John praised Mary his tongue dry' Korean (Kim and Maling 1997:194)[28]
(46) Sandy-ka koki-lul ppye-ka humuleci-key salm-ass-ta
Sandy-N meat-N bone-N gelatinous-KEY boil-Pst-Ind
'Sandy boiled the meat [until] the bone [became] gelatinous'

The phrase [*chimi malukey*] 'dry tongue' is construed as the result of John praising Mary (so much). We take the head to be an unaccusative adjective of type <t/nil/e>, with a nominative-marked complement; the AP phrases will then be of type <t/nil>. A predicate of this type can be adjoined at any level in the VP, using $ with operands of type <t/e>, and **B** if required; in any case, the nil role will be predicated of the subject. This accounts for the syntactic flexibility noted by Kim and Maling (1997:189 (1)b)). For example, the LF structure of the $P for (45) will be as in (47).

(47) [[Mary-lul chingchanhay-ss-ta] [chim-i malu-key] $]

The whole of the host VP, [*Mary-lul chingchanhay-ss-ta*] is raised at PF to the right-headed T. For (46), the $P will be as in (48), with V^0 as the host. This V will be raised to T.

(48) [[salm-ass-ta] [ppye-ka humuleci-key] $]

Note that the lower adjunction position allows the result phrase to be close to (and in fact c-commanded by) the object, to which it is implicitly anaphorically related.

7 Case

There are resultatives where the host verb is intransitive, such as those in (49). We refer to all these as having 'fake objects'.

(49) a Julie laughed herself silly
b Greta ate the plate clean

[28] Further relevant examples and discussion can also be found in Kim and Maling 1998.

c Ted drove his tyres bald

However, there are no equivalent depictive interpretations: (49a) cannot mean that Julie laughed while she was silly; (49b) cannot mean that Greta ate when the plate was clean; (49c) cannot mean that Ted drove with bald tires. But in each instance, the $P will have a type <t/e/e>, so there is no theta-theoretic bar to a depictive interpretation. We argue that the locus of the differential behaviour of depictives and resultatives lies in the theory of syntactic Case.

The default Case-licensing associated with object-roles is as follows (Burzio 1986: 178 ff): if the lexical head is transitive (type <t/e/e>), the role 2 position has [+Case] licensing; if the head is unaccusative (type <t/nil/e>), the role 2 position has no [+Case] licensing, and 'A-movement' is induced. Now consider $P such as those required for (50), [[$ DRY] [BOILED]] and [[$ HOT] [DRANK]]. The object by hypothesis is the object of the $P, not of the transitive verb inside it.

(50) a Yoko boiled the kettle dry
b Yasmine drank the tea hot

We make the natural assumption that the Case-properties of the $P are those of its host, just as with syntactic category. Since in each instance, the host is of type <t/e/e>, it licenses [+Case] on its role 2 position; this property is inherited by the $P, so that the object will be properly licensed.

This means that in the examples in (49), we can have resultative readings, which for English requires a V^0 $P (section 6.2). the host verb is of type <t/e/nil>. It has the "Nil2" property, and assigns a real role to the subject, but no role to the object. In the (a) and (b) examples, this type must be obtained by suppressing the normal role 2 (the cognate or real object, respectively), that is, by applying an Anti-Passive operator. We assume that by default, no Case is licensed on role 2 for such a type: it is not a canonic agent-patient type. If the host verb has no Case licensing property, then neither will the $P. Thus we expect both depictives (correctly) and resultatives (incorrectly) to fail to license objects. However, in the case of resultatives (but not depictives), the host verb is not the only V^0 present, since the $P itself is V^0. The V^0 $P for a resultative has the canonic transitive type <t/e/e> (both selections non-nil); such a type by default licenses Case on its role 2.

Thus the fake object in these resultatives will be Case-licensed, but no such licensing can be adduced for depictives.[29]

There are no fake object structures with unaccusative hosts (Rapoport 1991: 170).

(51) * I arrived myself sick

This is because the Nil2 Anti-passive operation is not available with unaccusatives.

8 Events

8.1 Introduction

In this section, we want to elaborate our earlier discussion of events, and discuss the status of Hypotheses II and III. We need to consider how event structure is coded in syntax. The first question is, if a single clause may represent one or more events, where is the quantificational binding of these event variables to take place? Initially, we take a simple Davidsonian event variable; using this we show why Hypothesis II is true. However, in line with the discussion in section 4.3, we need an event to have internal structure. The second question then is how this is syntactically coded. Essentially what we suggest is that instead of a single variable, *v*, for 'Event', we use two variables, 'π' for 'Process' and 'σ' for 'State'. Using these, we show that \$ conjunction at the V^0 level leads without stipulation to resultative readings. The third question concerns the correct syntactic instantiation of Hypothesis III. It does not seem that this is or can be an overt principle of syntax. However, it may be a desideratum for language, in some sense. For the languages we consider, it may hold by virtue of the selection requirements of the event quantifier or \$.

8.2 Single and multiple events

[29] Given the assumptions about Case in Cormack 1995, one further step is needed. In order to account for the separation of the host and the adjective at PF in the examples in (49), it is necessary that the host verb itself licenses [+Case]. The idea is that the AGR that contains the combinator for function-argument application involved in theta-role discharge by an object attracts and checks some [+Case] item. This may be the whole \$P, but may alternatively be a head inside it. If [–Case] is a default, we may assume that it can be overridden; and that the relation between the Case on the host and that on the mother \$P is a biconditional matching. Thus if the V^0 \$P licenses [+Case], then the matching feature is induced on the host.

The pervasive statement about true SVCs is that the two verbs represent 'a single event', in contradistinction to a possible representation of two events. We take it that the same applies to quasi-serials, so that using a Davidsonian event-variable, (52a) and the contrasting multiple event (53a) might perhaps be represented as in (52b) and (53b).[30]

(52) a John ran and bought a paper
b [John$_x$ [a$_y$ paper *y* [$\exists_v$ *event v* [ran *y x v* **and** bought *y x v*]]]
(53) a John both ran and bought a paper
b John$_x$ [**both** [[$\exists_v$ *event v* run *x v*] [**and** [a$_y$ paper *y* [$\exists_w$ *event w* [bought *y x v*]]]]

If we have one relevant instance of logical conjunction, and if the event role must be bound, then we will necessarily obtain just a single event if the event quantifier has scope over this conjunct and its operands, as in (52). In other words, Hypothesis II in its intended interpretation is trivially true. Concomitantly, in order that there be two events, the event quantification must take place inside the scope of the conjunction.

Note that in (52), the event quantification could be in any of several higher positions, as could the second in (53). We defer discussion of the proper position to section 8.5, turning now to the decomposition of events.

For ease of interpretation, we have used a quantifier-variable notation above. However, there is no evidence that natural language does use variables or indices, and theoretical parsimony should exclude them (Chomsky 1995: 217, footnote 53, Jacobson 1996: section 5). The decision to use variable-free quantification is not without consequences.

Consider a transitive verb, say BUY, with an event-role. The natural meaning in a variable-free notation will be as in either (54a) or (54b):

(54) a $\lambda v\, \lambda y\, \lambda x$ BUY(x, y, v)
b $\lambda y\, \lambda x\, \lambda v$ BUY (x, y, v)

Contra Higginbotham (forthcoming: 1.1), or Pustejovsky (1995: 68), we suggest that the correct ordering of the role selections at least for English is as in (54a). We will see in section 8.4 that for English, we need to bind the event role before the two entity roles are bound. But for all natural languages, the internal and external roles must be bound in the correct order, with the internal first. There cannot, therefore, be any compositional rule allowing the binding of an entity role to be deferred. This means that we can only use the meaning represented in (54a), and have a special compositional rule allowing the event

[30] Progovac (forthcoming) argues that *both ..and* necessarily gives rise to a two-event interpretation.

role binding to be deferred, by permitting its selection to be passed up the tree until it is bound. The required rule is parallel to Montague's for possible worlds, locations and times. Note also that given (54a), we expect the binding of the event role to occur before the binding of the entity roles; it will only be deferred if forced. For other languages, such as Nupe and Korean, there is evidence (based on the position of the Aspectual heads), that the event role is bound after the entity roles (and as in the Davidsonian representation). We tentatively assume that this is obtained via selection restrictions on the event quantification, rather than by treating (54b) as a parametric variant of (54a).

8.3 Event structure

We have seen in section 4.3 that the event itself must be decomposed in order to account for the properties of 'event composition' that we see in SVCs, quasi-serials, and secondary predication. The event decomposition we will use is based essentially on the extraction of features from a Vendlerian classification of events. We base our arguments on the event structure proposed by Moens and Steedman (1988), in order to account for aspectual properties of English.

The five event types that they give are as follows (note that almost no two people use the same terminology). First we have PROCESSES, such as *run*, *swim*, *walk*, *play the piano,* and CULMINATED PROCESSES (*build a house, eat a sandwich*). These extend over time. Events seen as instantaneous include POINTS (*hiccup, tap, wink*), and CULMINATIONS (e.g. *recognise, spot, win the race*). Finally there are STATES (*understand*, *love*, *know*, *resemble*). Their analysis is given in Table 1.

	EVENTS		STATES
	Atomic	extended	
+consequent state	CULMINATION	CULMINATED PROCESS	
–consequent state	POINT	PROCESS	

Table 1

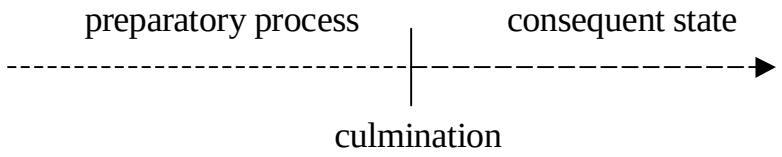
We see here that internal structure is necessarily assigned to Culminations and to Culminated Processes. The other categories are not intrinsically structured. States in fact cannot be temporally structured, since they hold by definition over all sub-intervals of

the interval for which they hold; nor can Points since they are not extended in time. A Process, on the other hand, can readily be seen as consisting of temporally related sub-processes which could be Processes in their own right: playing the first chord, swimming slowly at the end, and so on; unlike States, Processes are not restricted to any sort of uniformity over the period during which they occur.

Whether a Process is extended or not is taken to be given independently in the lexicon, as Meaning Postulates or Encyclopaedic information, along with its other properties. Thus the five categories of eventuality reduce to three: Process/Point, State, and Culmination/Culminated Process. The most articulated kind of event Moens and Steedman give is a Culminated Process. Pulman (1997) decomposes this into a pair <process, state>, where the State is the Consequent State. Such a decomposed representation is used by Grimshaw (1990: 2.4.3), Higginbotham (forthcoming: section 3) and others.[31] Parsons (1990: 12.3.1/2) implicitly uses the two components we propose, since in order to derive Progressive and Perfect aspects, he employs operators which extract from an event its 'In-progress state' (i.e. the State which holds when the Process component of the event is under way) and its Resultant-state (the State corresponding to the holding at some past moment of the State component of the event).

We wish to suggest that all X^0 eventualities can be seen as having a <process, state> structure. Note however that it is generally explicitly or implicitly assumed that the two components are temporally contiguous, with a determinate culmination point, as shown in (55), which is from Moens and Steedman (1988). However, we do not think that a Culmination Point is an obligatory component of an event, and omit it from the representation (see discussion of example (61) below).

(55)



Given our arguments for the 'transitive' nature of all predicates (and ignoring argument 3 etc. and temporal roles for the moment), we suggest that an adjective like *bald* will occur with the structure in (56b), rather than the structure in (56a), modelled on (54a).

[31] Others, such as Awóyalé (1988: 3.3), Déchaine (1993: 216, 4.2.6.1) and Pustejovsky (1995: 5.3) add further complexity. In some cases, what they are giving seems to be a characterisation of the total event structure of a typical clause, where this may contain more than one event as we have described matters.

(56) a $\lambda v\, \lambda y\, \lambda x$ BALD (y, v)
b $\lambda<\pi,\sigma> \lambda y\, \lambda x$: [BALD $(\sigma, y) \wedge$ Process $(\pi) \wedge$ State$(\sigma) \wedge$ Cnsq(π,σ)]

This states that the transitive adjective assigns to role 2 (the internal argument) the property of participating in a state of baldness; that the external argument will be assigned a nil role (by vacuous abstraction), and that the event will have a nil Process (because no properties are assigned to it), and a BALD state, and that the State is the Consequent State of the Process. Similarly, we will have the forms given in (57) for Nil2 *run* and for the Culminated Process *paint*:

(57) a $\lambda<\pi,\sigma> \lambda y\, \lambda x$ [RUN $(\pi, x) \wedge$ Process $(\pi) \wedge$ State$(\sigma) \wedge$ Cnsq(π,σ)]
b $\lambda<\pi,\sigma>\lambda y \lambda x$ [PAINT$(\pi, y\ x,) \wedge$ PAINTED$(\sigma,\ y) \wedge$ Process$(\pi) \wedge$ State$(\sigma) \wedge$ Cnsq(π,σ)]

The lambda abstraction over both event types simultaneously will be matched by pairwise quantification, so that from (57), we might quantify as in (58).[32] For compactness, we will now drop the regular statements 'Process $(\pi) \wedge$ State$(\sigma) \wedge$ Cnsq(π,σ)' from our representations when we do not need to refer to them.

(58) $\exists<\pi,\sigma> \lambda y\, \lambda x$ [PAINT $(\pi, y\ x,) \wedge$ PAINTED (σ, y)]

This change to a decomposed event, and the consequent change in the quantification, does not affect the argument for Hypothesis II put forward in the last section.

8.4 Generalised conjunction and event binding

We have proposed that in a sentence like 'Ted drove his tyres bald', the meaning is obtained by \$-conjunction of DRIVE and BALD. Given the representation we have been urging above, then if we simply use ordinary generalised conjunction, at type <t/e/e/(π,σ)>, we will obtain, after eliminating duplication:

[32] Note that this existential quantification is a drastic simplification, because we have omitted temporal roles; it is meant however to indicate that the existence of the designated Process and State (at relevant times whose values will be determined in part by Tense; see Larson and Segal (1995: 12.5) for some discussion, and Lasersohn (1992: especially 393) for the notion of the 'temporal trace' of an event which will be needed for the two event components individually).

(59) $\lambda<\pi,\sigma>\lambda y\ \lambda x$ [DRIVE $(\pi, x) \wedge$ BALD $(\sigma, y) \wedge$ Process$(\pi) \wedge$ State$(\sigma) \wedge$ Cnsq(π,σ)]

This simply IS a representation of a Culminated Process, such that the Process was driving (by the external argument) and the Consequent State of the object is BALD. It cannot be interpreted as a depictive, because the subparts of the event are stipulated to be in the Consequent State relation as part of the quantification. Similarly, *paint red* will correctly come out as shown in (60):

(60) $\lambda y\ \lambda x\ \lambda<\pi,\sigma>$ [PAINT $(\pi,y\ x,) \wedge$ PAINTED $(\sigma, y) \wedge$ RED $(\sigma, y) \wedge$ Process$(\pi) \wedge$ State$(\sigma) \wedge$ Cnsq(π,σ)]

Now consider the $-conjunction for the serial interpretation of *du gï*, 'boil eat' from (8), as in (61):

(61) $\lambda<\pi,\sigma>\lambda y\ \lambda x$ [(BOIL$(\pi,y, x,) \wedge$ BOILED $(\sigma, y)) \wedge$ (EAT$(\pi,y, x,) \wedge$ EATEN $(\sigma, y))$]
= $\lambda<\pi,\sigma>\lambda y\ \lambda x$ [[BOIL$(\pi,y, x,) \wedge$ EAT$(\pi,y\ x,)] \wedge$ [BOILED $(\sigma, y) \wedge$ EATEN (σ, y)]]

On the right-hand side, the conjunction of the two States gives the correct end-state: the food will end up both cooked and eaten. On the left, we have a conjunction of two Processes. We take it that this is (as usual) pragmatically interpretable (perhaps via the temporal variables which have not been shown) as the simultaneous occurrence of the two Processes, or as a sequence of the two (in the LF iconic order). In the instance here, we take the sequence. This seems to give the correct result, provided that we do not start to consider any Culmination Point. There is no properly interpretable Culmination Point, since the culmination of the cooking does not coincide with the culmination of the eating. Assuming that serial structures involving sequences such as *du gï*, 'boil eat' are indeed true SVCs representing single events, we see that the notion of a Culmination Point cannot coherently be introduced as an obligatory part of the event representation.[33]

What these exercises show is that generalised conjunction at the V^0 level automatically generates resultative or sequential/simultaneous readings. These are interpretable as single events provided the predicates involved are pragmatically related in a suitable manner, with the event quantification being introduced either before or after the entity

[33] Larson and Segal 1995: 506 section 12.5.1 argue that the Culmination Point is needed for a full account of depictives. It is possible that a Culmination Point may or may not be obtainable, according to the structure of the event.

quantifications. No stipulations whatsoever as to how the roles in such a complex event are to be amalgamated need be made. It can be seen, however, that the effect of generalised conjunction is to amalgamate the agent-like roles and the patient like roles, as in Neeleman's rules for theta percolation of roles in complex predicates (Neeleman 1994: chapter 4).[34]

What happens then if we want to express a depictive? It is clear from what we have just said that we cannot start by using $-conjunction at the true V^0 level; but we have shown in section 3 that in English, an object-orientated depictive can involve $-conjunction at what we then described as the V^0 level, before the object role is bound. The answer is to introduce event-quantification at the V^0 level, before the $-conjunction.[35] For the conjunction required in *John drank his coffee hot*, we will obtain a representation as in (62).

(62) $\lambda y\ \lambda x$ [[$\exists<\pi,\sigma>$ HOT (σ, y) $\wedge$ Process(π) $\wedge$ State(σ) $\wedge$ Cnsq(π,σ)] $\wedge$ [$\exists<\pi,\sigma>$ [DRINK (π, x, y) $\wedge$ BE-DRUNK (σ, y) $\wedge$ Process(π) $\wedge$ State(σ) $\wedge$ Cnsq(π,σ)]]

Here, we have two separate events, so nothing requires the State given by *hot* to be in any particular relation to the Culminated Process given by *drink*.[36] The interpretation can proceed in the usual fashion, guided by iconicity, to give the depictive reading as required.

8.5 Hypothesis III

[34] Note that the compositional effects of generalised conjunction are unlike those of Li (1995). However, we have not considered the interesting problems posed by the third reading of Chinese resultative VV complexes.

[35] Event quantification at this level might be thought to cause problems for Aspectual interpretation. An Aspectual head needs to be introduced prior to event quantification. However, Cormack and Smith (1997) argue that in English the Progressive aspect is instantiated at an Inflection head giving *-ing* (rather than at the Auxiliary *be*), and that this is merged at a low position adjacent to V^0. For phrases like *Eleanor read the book for half an hour*, we assume that the temporal phrase *for half an hour* is adjoined to V^0 before the event quantification is merged, in order that the atelic aspectual reading is induced.

[36] We claim that *drink* represents a culminated process, where the liquid drunk ends up in the person drinking. Clauses containing *drink* are frequently atelic just because the liquid drunk is often given using a mass term.

What we have established so far, then, is that $-conjunction at the type level <t/e/e/(π,σ)> may give rise to a single event; and $-conjunction at the type <t/e/e> may represent multiple events. The question arises as to whether a single event reading may be obtained from $-conjunction at any other level, for example, the VP level, where the $ type would have to be <t/e/(π,σ)>. If we can show that the answer is 'no', then we have derived Hypothesis III, which requires $P at the V^0 level for a single event. A case in point would be a subject-orientated resultative, derived from the $P shown in (63b).

(63) a *John chased Mary tired

b $\lambda x\ \exists<\sigma,\pi>\ [[\mathbf{TIRED(\sigma,\ x)}] \wedge [\text{CHASE}(\pi,\ \text{Mary},\ x) \wedge \mathbf{CHASED(\sigma,\ Mary)}] \wedge (\text{Process}(\pi) \wedge \text{State}(\sigma) \wedge \text{Cnsq}(\pi, \sigma)\ ]$

There is apparently nothing the matter with this as a single event; but we know that subject orientated resultatives are ungrammatical in English. The question then is, why this should be so.

The answer may hinge on the fact that the representation in (63) has a Consequent State which is a conjunction of a State of Mary and a State of the external argument. As noted by Higginbotham (forthcoming:3.1), the property of "Measuring out" the event (Tenny 1994) necessarily accrues to the argument of the Consequent State (Higginbotham's "telos") within a simple event. Tenny says (1994: 11) that 'There can never be more than one measuring out for any event described by a verb'. If we take this to include complex predicates which are single events, we rule out examples like (63), but not without a stipulation.[37]

An alternative move is to consider that the complex predicate in (63) assigns to the external argument both agent-like and patient-like roles. We need to ask, then, how syntax connects with proto-Agent and proto-Patient roles (Dowty 1991). The proto-role statements could and perhaps should be made at a lexical level, in the same manner as the event role statements: they are in a sense already implicit in the event description.[38] Indeed, the two are closely connected, as is clear from the variation between languages

[37] Note that the exclusion of representations like that in (63) is essential to an enterprise such as that of Borer (1994), where the direct object is introduced by heads explicitly coding for the 'aspectual' property related to event measurement.

[38] This can most clearly be seen if we consider 'deep ergative' languages like Dyirbal (Dixon 1972). In such languages, if we take role 1 as the typically agentive one, and role 2 as the typically patient one, then role 1 is assigned to the object and role 2 to the subject. The general event in Dyirbal will have type $\lambda x\ \lambda y\ \lambda<\pi,\sigma>$ [X (π, y, x), Y(σ,y)] instead of $\lambda y\ \lambda x\ \lambda<\pi,\sigma>$ [X (π, y, x), Y(σ,y)]

as to what counts as an unaccusative verb, or a State.[39] The rubric '$\wedge$ Process(π) $\wedge$ State(σ) $\wedge$ Cnsq(π,σ)' which stipulates the proper properties of the event arguments needs to be extended to cover the properties properly held by the entity arguments. For example, a Culminated Process represented by *paint* will then have a representation like that in (64):

(64) $\exists$<π,σ> λy λx [PAINT (π ,*y*, *x*,) $\wedge$ PAINTED (σ, *y*) $\wedge$ proto-Agent(*x*) $\wedge$ proto–Patient(*y*) $\wedge$ Process(π) $\wedge$ State(σ) $\wedge$ Cnsq(π,σ)]

Given this, we can see that the extended representation of (63), the putative single-event subject-resultative, will contain an internal anomaly, in that the external argument will be assigned proto-Patient properties by *tired* and proto-Agent properties by *chased*:

(65) λy λx $\exists$<σ,π> [[TIRED(σ, *x*) $\wedge$ **proto–Patient(*x*)**] $\wedge$ [CHASE(π, Mary, *x*) $\wedge$ CHASED(σ, Mary)] $\wedge$ proto–Patient(*y*) $\wedge$ **proto-Agent(*x*)** $\wedge$ Process(π) $\wedge$ State(σ) $\wedge$ Cnsq(π,σ)]]

The assigning of both proto-Agent and proto-Patient roles to a single argument is of course not in itself a source of ungrammaticality, as witness subject orientated depictive sentences like (66).

(66) John drove his car drunk

We need to contrast (63) with the well-formed (66). As we have argued in section 4.3, a depictive is not represented as a single event, whereas the representation in (63) purports to be. We show the result of such a derivation using **B**, in (67), for the $ conjunction of DROVE and DRUNK as in *John drove his car drunk*.[40]

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[39] For unaccusativity and unergativity, see Sorace (1999).

[40] In section 3, we suggested that a subject orientated depictive might be constructed in one of two ways, both of which involve taking $ at the <t/e> level. However, this discussion did not include event roles. If these are taken into account, it turns out that the route requiring **B** is permitted only if the two operands of $ are already given event-quantification (by the rules of composition, and taking into account the basic type <t/e/e/(π,σ)> for a lexical head).

(67) λy λx [[∃<π,σ> [[[DRUNK](*x*, σ) ∧ **proto–Patient(*x*)** ∧ Process(π) ∧ State(σ) ∧ Culminate(π,σ)] ∧ [∃<π,σ> [DROVE] (*x*, *y*, π)] ∧ proto–Patient(*y*) ∧ **proto–Agent(*x*)** ∧ Process(π) ∧ State(σ) ∧ Culminate(π,σ)]]

It is clear that what we want to say here is that although the external argument will be assigned both proto-Agent and proto-Patient properties, this is legitimate just because these arise from separate events. Thus we could account for the difference between (65) and (67) by requiring that a single event not have mixed roles for any argument. This would account for the unacceptability of the parse of (65); but again, we need a stipulation.

However, although each of these suggested reasons for the unacceptability of (63) seems to be correct, each seems dubious, since it requires that when the event quantification is Merged, there is some checking as part of the grammar of the internal structure of its complement. The question then is the following: can anything like Hypothesis III be true either of particular languages or of NL generally? If so, how and where is the constraint expressed in the grammar?

Interestingly, it turns out that for English at least, ordinary selection restrictions may be used to rule out untoward structures of this kind. We argued in section 8.4 that event quantification can be introduced at the V^0 level (in order that object orientated depictives are possible). Suppose then that in English, the event quantification '∃<π,σ>' obligatorily selects for a V-projection of type <t/e/e/(π,σ)>. Since the event role is presented before the entity roles (section 8.2), this may not need any stipulation. This in itself will ensure that Hypothesis III holds for English. Preliminary investigations suggest that analogous but distinct constraints, this time relating to the selection of the operands of $, may ensure the effect in Korean, and perhaps also in Nupe. Such a solution would tend to suggest that the Hypothesis is a high-level one, perhaps comparable to the requirement that V^0 $P represent coherent and pragmatically plausible events, with the syntax conspiring to ensure its holding.

Somewhat similar concerns arise in relation to Hypothesis II. The normal locus of iconicity proposed is surface order. However, since the PF structure does not necessarily enter into the retrieval of the proposition expressed in the way that the LF representation does, the move to LF iconicity is preferable. We have argued in previous work (Cormack and Smith 1998) that for independent reasons, LF is ordered (essentially, by c-selection or scope). It is not however entirely clear where in the grammar the relevant constraint is to be formulated. The most likely place seems to be in association with the semantic entry for $, which includes related inference rules. It remains true that the iconicity requirement is a processing directive, and generally these belong to pragmatics,

and are defeasible in appropriate contexts. The flouting of the requirement of Hypothesis II however leads to ungrammaticality (e.g. in an English putative subject resultative).

9 Conclusion

We have argued for the claim that, despite a number of well-known syntactic differences, all of serial verbs, quasi-serials, depictives and resultatives should be analysed as instances of asymmetric conjunction exploiting the two-place operator $. In defending this parsimonious position we have extended our earlier use of nil roles, and have proposed a number of specific hypotheses. First, we argue that states are always unaccusative. Second, we elaborate on the structure of events, suggesting that V^0 $P represents a single event and, more tentatively, that any phrase representing a single event is a V^0 $P. Third, we have proposed that the interpretation of multiple events is crucially dependent on iconicity at LF. We have illustrated and defended these claims on the basis of a wide variety of data from English, Dutch, Nupe and Korean.

We started with a general framework in which the complex predicates we are considering all derive from asymmetric conjunction. We have used four hypotheses, and some language specific selection properties of minor heads, to show how a variety of grammatical or ungrammatical readings of putative resultative or depictive sentences can be accounted for.

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