

Denominal Verbs and Aktionsart*

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1. Some questions about the vP in Distributed Morphology

In much recent work in DM and elsewhere, (among others, Kratzer 1993, Chomsky 1995, Hale and Keyser 1991, and Harley 1995) the addition of a vP (selecting an agent argument) on top of the “basic” VP (selecting internal arguments) has suggested a return to a Generative Semantics–style analysis of, for instance, causative-inchoative alternations like those illustrated in (1):

- (1) a. Susan opened the lid / The lid opened.
- b. Susan broke the VCR / The VCR broke.
- c. Susan grew the tomatoes / The tomatoes grew.

In particular, Marantz 1997 and Harley and Noyer 1998 get a great deal of mileage out of the syntactic nature of the alternations listed in (1) above. The nominalization of an alternating verb like “grow” as originally noted by Chomsky 1970, does not permit an agentive interpretation, while the nominalization of a non-alternating verb like “destroy” does (2).

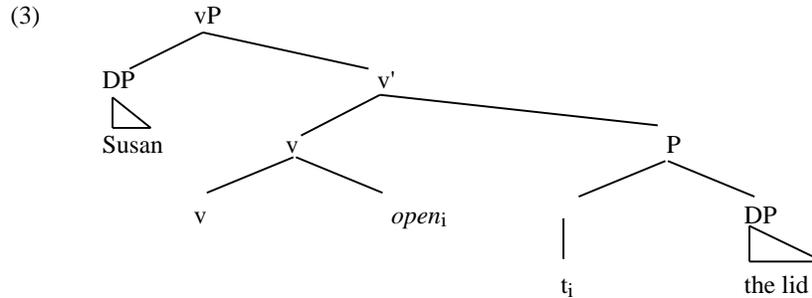
- (2) a. #Susan’s growth of tomatoes.
- b. The army’s destruction of the city.

Marantz argues that this is a natural consequence if the nominalization takes as its input the simple V root, without the v head which selects an agent in the verbal frame. The information which is needed to give an agentive interpretation to a genitive possessor must reside in the verb root. No appropriate information is available in the root *grow*, due to its spontaneous meaning, while the non-spontaneous nature of the root *destroy* does allow the agentive interpretation in the nominalization (cf. Levin and Hovav 1995).

In the causative version of the verbs in (1) above, then, the v head which selects for the optional agent must contribute a meaning close to CAUSE

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(since that meaning is not available in the verb root itself). The underlying representation of the causative version of the verb “open” is as illustrated in (3)¹:



The questions I intend to address in this paper are, what is the interpretation of the P^2 , and what are possible denotations for the incorporated head? I will argue that boundedness information specified on the lexical head which is incorporated in denominal verbs is present in the surface verb form, lending support to the notion that the sources of these verbs are in fact nominal roots. In section 6, I will claim that the syntactic nature of the lexical-syntactic structure entails that the boundedness of the nominal root of a location/locatum verb affects the telicity of the resulting verb, while the boundedness of the instrumental nominal root of a denominal activity verb is predicted not to affect the resulting verb's telicity. As a side point, I argue that the interpretation of the v head is fully contextually determined, based on the denotation of the P which is its sister, and the presence or absence of the specifier of vP .

2. Denotations of vP

In Harley 1995, I argued that at least for these causative/inchoative verbs, the event³ introduction was accomplished by vP alone. In the inchoative version, the vP (without a specifier) is headed by a v meaning, essentially, BECOME, and the complement of vP , the P , is a predicative structure denoting a state, the end result of the change of state introduced by the v head (in the structure in (3) above, [door open]). In the causative version, on the other hand, the BECOME v is replaced by a CAUSE v , which selects an external argument in its specifier. Now, the change-of-state introduced by the v head is interpreted as caused, rather than spontaneous, because of the agent argument which is projected.

¹ In this structure we have of course omitted the inflectional complex which dominates vP , as well as any functional projections which intervene between P and vP .

² Read, "Root P ". This notation for roots is due to Pesetsky 1995.

³ By “event” here I mean dynamicity, not eventuality. As the reader will see below, states (a type of eventuality) may clearly be represented in structures containing no vP . The claim in Harley 1995 was that non-stative events are always represented in a structure containing a vP .

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This approach differs crucially both from that of the generative semanticists and the usual generative lexicon-style approach in claiming that the BECOME meaning component is replaced in causative by the CAUSE meaning component, rather than added on in, e.g., a higher vP. Evidence for this approach in Harley 1995 came from a study of Japanese lexical causatives and inchoatives, which exhibit morphology which is arguably an overt realization of the v head. The causatives never demonstrate stacking morphology; rather, the BECOME morphology is in complementary distribution with the CAUSE morphology.

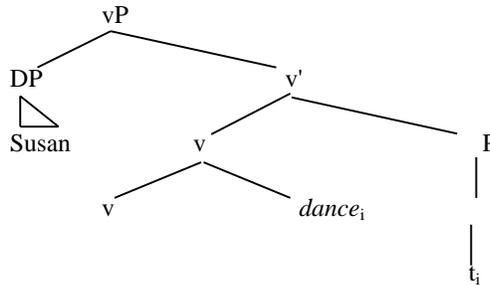
This limitation on the degree of syntactic decomposition of the causative verb obviates many of the problems encountered by the generative semanticists; in particular, it eliminates the objections raised by Fodor 1970, which stemmed from the fact that the generative semanticists were representing two events in their articulated structure (CAUSE to BECOME...). Here, there is only one dynamic event head, combining with a phrase denoting the resultant state. Hence the "cause-to-die" problems do not arise, as there is only one event represented in the structure. In favor of the syntactic decomposition approach, rather than a generative lexicon-type approach, von Stechow 1995 has argued that the scope ambiguities evident in constructions like (4) are most felicitously captured in a syntactic-decomposition approach. The present proposal allows the observed scope ambiguities (adjoining "again" to P or vP) and no others.

- (4) Susan opened the lid again.
- i. "again" P adjoined:
Susan opened the lid, which had been open before.
 - ii. "again" vP adjoined:
Susan opened the lid, which she had done before.

On this view, the P denotes a state, and the head is a one-place predicate which takes a single DP argument. In some cases in English, there is morphological evidence for this view: the obvious adjectival roots of the deadjectival verbs "open", "clear", "reddden", etc.

However, it seems equally clear that this cannot always be the case. Hale and Keyser, in an important series of papers on the syntax of lexical items, argue that roots may often denote things or events, rather than properties. For example, in verbs such as "John coughed," "The mud caked," "Sue danced," or "The mare foaled," the head is morphologically identical to the base element in nominals like "a cough", "a cake", "a dance", and "a foal". In these cases, it seems clearly wrong to posit a predicative denotation for the root, and a "resultant state" denotation for the P (something like "The mare is foaled" or "Sue is danced"). Rather, as Hale and Keyser maintain, it must be the case that the root is simply the bare nominal. In the system outlined here, the structure would be something like that in (5) below, where the nominal head (and hence the whole P) denotes an event or a thing, and the v head is DO or MAKE accordingly:

(5)



If the *v* in these verbs was predicative, the verbs created from them should (a) have an internal argument and (b) undergo a causativization process like those in (1) above. Yet, in every case, they appear to be syntactically unergative, and their single argument has the status of an external argument. Further, the nominal forms exhibit no special morphology, being simply homophonous with the bare verb; there's never an underived form which can denote a relevant property (unlike the case of the deadjectival verbs above).

Is there any other evidence we can bring to bear that suggests that the *v* node in these and other cases is in fact actually the nominal head? I wish to suggest that there is, and it has to do with the types of things nominals may denote.

3. Similarities between kinds of things and kinds of events

It's long been clear that certain aspects of nominal meaning have a clear parallel in the verbal realm. In particular, the mass/count distinction in the spatial dimension, as exhibited by things, is analogous to the bounded/unbounded distinction in the temporal dimension, as exhibited by events, as noted in Bach 1986, Gruber 1967 and Talmy 1978, among others. Jackendoff 1991, 1996 proposes to encode boundedness the same way for events and things, using a feature [\pm bounded]; the table below gives examples of each proposed basic type⁴:

(6)

	Thing	Event
+bounded	apple	flash
-bounded	water	sleep

⁴ The intuitive content of the notion \pm bounded is the following: Subparts of unbounded things or events are themselves examples of those things or events (any minute of an hour-long nap is still appropriately described as "sleep", any drop of an ocean of water is still "water"). Subparts of bounded things or events are not examples of those things or events (a piece of an apple is not an apple, the second half of a jump is not a jump). Unbounded items are in principle arbitrary in size and shape, spatial or temporal; bounded items are not. See Jackendoff 1996 for further discussion.

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Now, it's clear that the spatial boundedness of elements in the VP affects the temporal aktionsart of the entire denoted event, as demonstrated in Tenny 1992 and Dowty 1991. So, if a simple transitive verb like "eat" has an unbounded nominal for a direct object like "candy" or "apples", as in (7a), the entire event described is unbounded, according to standard tests. Similarly, if the verb has a bounded object like "an apple" or "the candy", the entire event described is bounded according to the same tests⁵:

- (7) a. #Sue ate apples/candy in an hour.
Sue ate apples/candy for an hour.
b. Sue ate an apple/the candy in an hour.
#Sue ate an apple/the candy for an hour.

So, let's say that denominal verbs have as their an element which denotes an event or a thing, and that boundedness is an inherent property of events or things. We should expect to find an important correlation between the boundedness of the simple nominal and the boundedness of the denominal verbs. At least for the cases of the denominal verbs we've been considering, this seems to be clearly correct when the denotes a thing:

- (8) a. The mud caked in an hour/#for an hour.
b. The mare foaled in an hour/#for an hour.
c. Mary drooled #in an hour/for an hour.

"Cake" and "foal" are spatially bounded things, and the denominal verb which may be derived from them is in fact temporally delimited. "Drool" is a spatially unbounded thing, and the denominal verb which is related to it is temporally unbounded⁶.

In the cases of denominal verbs where the nominal base denotes an event rather than a thing, a couple of complicating factors crop up. Firstly, it may not seem like such a surprise that a temporally bounded or unbounded event, when incorporated into a verb, results in a temporally bounded or unbounded (respectively) verb phrase. Secondly, the bounded events from which denominal verbs are derived seem, interestingly, to be instantaneous in nature; what Smith 1991 terms *semelfactive*. Semelfactives are subject to an interesting coercion process: they are perfectly felicitous in the "for an hour" frame we have been using as a test for unboundedness, but only on a *repetition* interpretation. So, for instance, (9c) and (9d) may mean that Sue coughed or jumped repeatedly for a minute, but not that a single cough or jump occupied the

⁵ Note that "candy" is inherently unbounded, but as Jackendoff notes, it may acquire a [+b] feature in the syntax, from a determiner. Similarly, "apple" is inherently bounded, but it may acquire a [-b] feature in the syntax by pluralization.

⁶ The only counterexample I can currently think of is "spit", which seems pretty clearly to be a bounded event as a verb (like "jump") but in the nominal frame it appears to be a mass noun, i.e. [-b].

time span of a minute. The # notation by the “for a minute” tester indicates the unavailability of that latter reading, which is the one we are interested in here.

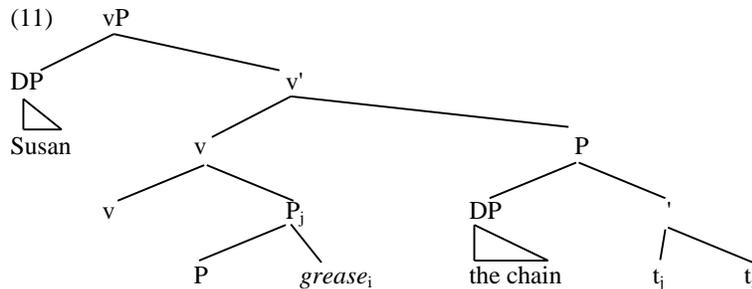
- (9) a. Sue danced #in an hour/for an hour.
 b. Sue slept #in an hour/for an hour.
 c. Sue jumped in a flash/#for a minute.
 d. Sue coughed in a flash/#for a minute.

4. Denominal location/locatum verbs and event type

The above remarks are suggestive, but hardly conclusive. A more significant testing arena is the class of verbs Hale and Keyser label “location/locatum” verbs; essentially, verbs of putting. The P in these cases is again predicative, as in the deadjectival cases above, but rather than being headed by a that is a one-place predicate, these are headed by a prepositional element, which is a two-place predicate, explicitly representing the “putting” nature of these verbs in the syntax. The complement to the P incorporates into it, and that complex incorporates into the v head, which here is CAUSE (these states always being, apparently, inherently non-spontaneous). Some location/locatum verbs are listed in (10) below; for a more exhaustive listing and interesting discussion see Kiparsky 1997.

- (10) *put* verbs:
 Location: bag, bank, bottle, box, cage, can, corral, crate, floor (opponent), garage, jail, kennel, package, pasture, pen, photograph, pocket, pot, shelve, ship (the oars), shoulder, tree.
 Locatum: bandage, bar, bell, blindfold, bread, butter, clothe, curtain, dress, fund, gas, grease, harness, hook, house, ink, oil, paint, pepper, powder, saddle, salt, seed, shoe, spice, water, word.

The argument structure for such verbs is illustrated in (11):



The semantic content of the elements in this structure may be roughly paraphrased as “Susan CAUSE [the chain WITH grease]”; or in a more natural English paraphrase “Susan plastered the chain with grease”. A location verb has

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the same structure with a different P head: “Susan CAUSE [the book ON the shelf]”, or “Susan put the book on the shelf”.⁷

Now, the interesting claim is, all other things being equal, the nature of the incorporated nominal which forms the denominal verb will affect the default aspectual interpretation of the verb. If the incorporated nominal is of the “count” type, the resulting verb will be telic (bounded); if a “mass” type, the verb will be atelic (unbounded).

Let’s examine this prediction in pieces. First, consider the incorporation of a count noun, as in the example sentences in (12):

- (12) a. Mary saddled the horse in 5 minutes/#for 5 minutes.⁸
b. John boxed the computer in an hour/#for an hour.
c. Sue blindfolded Billy in 2 minutes/#for 2 minutes.
d. The blacksmith shoed the horse in an hour/#for an hour.

Evidently, our prediction is borne out: when the incorporated nominal is bounded, the event described by the verb is inherently telic. One could argue, however, that the boundedness of these events derives entirely from the bounded nature of their objects, as in the case of the telic events in (7b) above. (The telicity inherent in the event denoted by the verbs themselves seems to me to be intuitively obvious here (as opposed to the indeterminate nature of “eat”, for example); these events have an inherent endpoint.) Aside from whatever force my intuitions have, however, the case become more convincing when we investigate the telicity status of denominal locatum⁹ verbs whose nominal root is unbounded:

- (13) a. Susan watered the garden in an hour/for an hour.
b. Bill greased the chain in 5 minutes/for five minutes.
c. Jill painted the wall in an hour/for an hour.
d. Adelaide buttered the bread in 2 minutes/for 2 minutes.

The interesting point here is that while the bounded reading is certainly available, an *unbounded* reading is equally available, which is emphatically not the case in (12) above. That is, these activities have no inherent endpoint. The possibility of an endpoint with these verbs is the result of the presence of a direct object, which may “measure-out” the event in the sense of Tenny. The crucial fact to notice, though, is that it doesn’t *have* to measure out the event: an

⁷ For discussion of the nature of these two different primitive prepositional heads, LOC and HAVE, see Pesetsky 1995, Harley 1995, or Kiparsky 1997.

⁸ Of course, the “for 5 minutes” adverbial is felicitous if it’s assumed to describe the end state, rather than the event of saddling; again, this is not the interpretation we’re interested in here.

⁹ Only the locatum verbs will be relevant in this case, as it seems that for fairly transparent interpretive reasons, locations are always bounded. The structures remain the same, however.

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unbounded reading is possible. In (12), no unbounded reading is available at all. This distinction, I claim, results from the fact that the nominal source for the (12) verbs is spatially bounded, while the source for the (13) verbs is spatially unbounded.

A question I will leave open at this point is whether or not the notion of boundedness at issue here is conceptual or grammatical. Consider, for instance, the verb “bandage”. “Bandage” as a noun behaves morphologically like a count noun (“*I like bandage”), but as a concept, it seems to be potentially unbounded, since a bandage may be of arbitrary length. Judgements are unclear as to whether the denominal verb “bandage” reflects the conceptual unboundedness of “bandage” or the grammatical boundedness of the noun: “Sue bandaged John in 5 minutes/%for 5 minutes”. If it should turn out to be the former notion which is important, it would appear to be in line with some evidence in Harley and Noyer 1998, which shows that the conceptual spontaneous/non-spontaneous properties of the roots are what is important in the causative/inchoative alternation, rather than any grammaticized features which correlate with the concepts¹⁰.

5. The source of eventiveness and the meanings of v

So, back to the original discussion of where the event comes from in the representation. Clearly in these denominal location/locatum verbs, the situation is considerably more like that of the deadjectival verbs we considered initially: the P denotes a state, and the v head denotes CAUSE, introducing eventiveness.

In the case of the denominal unergative verbs, however, the question seems less clear. When the incorporated root nominal denotes a thing, the v head seems to be interpreted as MAKE (“The mare foaled”, “The mud caked”, “Susan drooled”), and the source of eventiveness must again be the verbal frame, the v head. However, when the nominal denotes an event, the v head (in Hale and Keyser’s terms) means DO (“Susan danced,” “John coughed”), and it seems more likely that the eventiveness is introduced by the nominal root itself.

Denominal verbs that denote events need not be intransitive. Consider the [+b] events in (14a) and the [-b] ones in (14b):

- (14) a. hit, kick, kiss, knock, pinch, rap...
b. feel, touch, tickle, hold, clasp...

¹⁰ The argument hinges crucially on variable-behavior verbs like “accumulate” or “break”: depending on their object, they may behave like a necessarily unaccusative or necessarily causative, although with other objects, they alternate freely:

- (i) John accumulated wealth/ John’s accumulation of wealth.
(ii) Dust accumulated /#John’s accumulation of dust.
(iii) Sue broke the world record/#The world record broke.

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Here, the P is branching, with the taking a complement DP; however, the event-denoting nature of the prevents the branching P from being interpreted as a state (cf. Kiparsky 1997).

The [\pm b] contrast permits only a two-way distinction for the basic named events: they must be either bounded or unbounded. Interestingly, all the event-naming nominals we have considered here fall into one of two event classes (in the terms of Vender 1967): Achievements (instantaneous events)¹¹ or Activities (events of arbitrary length). No Accomplishments, events requiring a period of time to occur, seem to have monomorphemic nominal names.

This fits in with the syntactic taxonomy we are developing here in that any changes of state – which Accomplishments necessarily are – will involve a P which denotes a state, and hence involve a predicative, either adjectival or prepositional. Pustejovsky 1991 proposes that Accomplishments are invariably constructed from two distinct predicates. In the present proposal, this aspect of the structure of Accomplishments is directly encoded in the syntax. The tight correlation between semantic primitives, syntactic projection and morphological pieces of Distributed Morphology makes a strong prediction: in fact, there should be *no* zero-derived nominals referring to Accomplishments. A full investigation of this prediction will have to await further study.

So far, although my wording has perhaps suggested an underdetermined meaning for *v*, I have not been explicit about whether or not there are 4 different lexical items that may occupy the *v* slot or rather whether the semantic contribution of *v* is uniform and underdetermined, with the syntactic and semantic environment providing the cues necessary for appropriate interpretation. So far, the underdetermination approach seems viable. The semantic “primitive” associated with *v* is fully determinable in context; no lexical content for *v* (other than introducing a specific temporal anchor) need be posited. In (15) I list the possible paraphrases for *v* that we’ve so far encountered along with their determining environments:

¹¹ As alluded to above, Smith 1991 argues for a distinction among the Achievement verbs: those which are coerced to a repetition reading (i) in e.g. a progressive are Semelfactive, those which are coerced to a pre-event focus (ii) in a progressive are true Achievements.

- (i) Sue was knocking on the door when the phone rang.
- (ii) Jane was winning the race when the camera flashed.

Clearly, the event-denoting nominals under discussion are semelfactive. Achievements will fall together with Accomplishments as involving predicative Ps, in the present taxonomy, but an extended discussion is beyond the scope of this short paper.

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- (15) a. v + STATE, no specifier = BECOME
b. v + STATE, specifier = CAUSE
c. v + THING (specifier required) = MAKE¹²
d. v + EVENT (specifier required) = DO

So at least for the present purpose, v may be the same lexical item in all contexts, simply interpreted in different ways according to its immediate environment. The homophony of “do”, “make” and “cause” verbs in a language like French (all of which translate as *faire*), can be taken as preliminary support for this position. However, in this paper I have not considered other potential candidates for the light verb head, of which many have been proposed: GO, APPL, TAKE, BENEF, EXPER, etc.

6. An apparent problem: denominal activity verbs

There is a large class of denominal verbs which I’ve ignored here which are a *prima facie* counterexample to the primary generalization of this paper. These are denominal activity verbs like those listed in (16a) below; as can be seen from the tests in (16b-d), they behave like the unbounded locatum verbs above, despite the fact that their incorporated nominal is clearly spatially bounded:

- (16) a. shovel, brush, sponge, mop, rake...
b. John shoveled the driveway in an hour/for an hour.
c. Patty brushed the horse in an hour/for an hour.
d. Jill raked the gravel in an hour/for an hour.

In fact, this contrast constitutes some of the clearest evidence that the structure of denominal verbs is syntactically complex in the manner that Hale and Keyser propose. The nominal incorporated here does not encode a Goal or Theme, in theta-theoretic terms, but rather an Instrument. Goals and Themes may delimit the event denoted by a verb phrase (indeed, Goals must do so); Instruments may not. Consider the paraphrases for the Locatum denominal verbs in (17a) below, in contrast with the paraphrases for the Instrument denominal verbs in (17b):

¹² It’s worth noting that in this case, the subject of the denominal verb must make the item named by the verb *from itself*: “The mud caked” is acceptable, because the mud itself becomes the cakes, but “John caked” is not, meaning “John made a cake”. Similarly for “drooled”, for example; Sue cannot be said to have drooled if she merely lets a mouthful of water she’s drinking dribble out of her mouth, rather, the stuff coming out of her mouth must be her own drool (saliva). So far the only likely candidate for an exception to this generalization that I’ve come across is the verb “to pot”, meaning to do as a potter does, and make pots. It seems likely that insofar as this is a robust generalization, it is due to whatever aspect of the vp+ P structure is responsible for the famous “direct causation” effect in monomorphemic agentive (i.e. causative) verbs, most likely the “single event” nature of the representation, as discussed above.

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- (17) a. Susan fit the horse with a saddle in an hour/#for an hour.
Bill sprayed the garden with water in an hour/for an hour.
John fit Jill with a blindfold in a minute/#for a minute.
- b. Jill leveled the gravel with a rake in an hour/for an hour.
Patty rubbed the horse with a brush in an hour/for an hour.
John cleaned the floor with a mop in an hour/for an hour.

All the paraphrases have the same telicity properties as their incorporated denominal counterparts. Note in particular that when the locatum is made [-b] by pluralization, it has the expected effect on the telicity of the VP (compare to (17a):

- (18) a. Susan fit the horse with saddles #in an hour/for an hour.
b. John fit Jill with blindfolds #in an hour/for an hour.

This option is of course not available in the corresponding denominal verb; in order to incorporate (in English), the must be bare, not contained within a DP.

What is important to note, however, is that the syntactic status of the “with” phrase in the (17a) examples is significantly different than that of the instrumental “with” phrase in the (17b) examples. As a quick preliminary syntactic test, consider the status of a manner adverbial between the direct object and the “with” PP in the (a) and (b) cases below:

- (19) a. ??Susan fit the horse quickly with a saddle.
b. Jill leveled the gravel quickly with a rake.

In the (a) examples, the “with” phrase seems to be a complement to the object DP, while in the instrumental cases, it behaves more like an adverbial element, right-adjoined either to P or vP. The fact that the boundedness of the incorporated nominal affects the telicity of the resulting denominal verb in the locatum verbs but not the instrumental verbs reflects the differing syntactic status of the nominal elements before incorporation in each case.

Note that a Lexicalist approach which involves simply “naming the verb after the noun” like that discussed in Kiparsky 1997 would have a great deal of difficulty in accounting for the apparent correlation between nominal boundedness and verbal telicity in locatum verbs while simultaneously predicting the lack of correlation in the activity verbs. The syntactic approach predicts such a difference: if the structural source of the activity verbs’ nominal roots is different from the structural source of the location/locatum verbs’ roots, the effect of the root on the telicity of the final verb should be the effect we would expect from a non-incorporated argument in the corresponding position.¹³

¹³ Admittedly, if we wish to posit a structural source for the incorporated nominal in the activity verb cases, we will have to admit some strange-looking incorporation structures, where the root nominal incorporates to v from an adjoined adverbial position. This is

7. Conclusions

In this short paper, I've argued in support of the notion of syntactic decomposition of verbs, and in particular to a particular treatment of denominal verbs involving syntactic incorporation of nominal roots, by pointing out that the boundedness of an incorporated nominal root (in an appropriate syntactic position) affects the boundedness of the denominal verb. In addition, I've sketched the beginnings of a solution to a theory-internal problem of Harley 1995, where *v* always denoted CAUSE or BECOME. Limiting the denotation of *v* forces a commitment to a predicative analysis of all complements to *v*. Recognizing that the complement to *v* (*P*) may denote events or things as well as states, however, enables us to contextualize the interpretation of little *v* in an appropriate and attractive way, maintaining the larger picture of *v* as a lexically underspecified functional item.

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counter to the overall program of Hale and Keyser (although not necessarily counter to the assumptions of Distributed Morphology), who claim that lexical incorporation of this type is governed by the same restrictions that govern syntactic head-to-head movement (in particular, whatever equivalent of the ECP one wishes to invoke). Other investigation of the contrast between the availability of Manner incorporation in English and, e.g., Spanish, however, suggests that incorporation from an adverbial position must be allowed in some languages. For discussion, see Harley (in prep).

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