How do verbs get their names?

Denominal verbs, Manner Incorporation and the ontology of verb roots in English[*]

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Abstract: Evidence is presented showing that denominal verbs in English, of both the location/locatum variety and the unergative variety, are 'measured-out' by the incorporated nominal Root. This strongly supports Hale and Keyser's (1993 et seq.) l-syntactic approach, since it shows parallel semantic effects of identical structures in overt syntax and l-syntax, and suggests that English Roots of denominal verbs have inherent semantic properties, in particular, 'boundedness', which determine the effects they produce when they are Incremental Themes.

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The analysis presented is not obviously compatible with a functional-projection approach to Aktionsart like that of van Hout (2000), Borer (1996), or Ramchand (2001).

1 Introduction: Resorting aspectual classes

Discussions of Aktionsart and verb class generally distinguish three types of eventive VPs: Incremental Theme verbs, such as *eat, draw, write,* and *destroy*, Change of State verbs, such as *open, clear,* and *flatten*, and other unergative and transitive verbs, including activities, semelfactives, and some others, such as *run, drool* and *push*. Since both Incremental Theme and Change of State verbs are usually Accomplishments, and both may exhibit Tenny (1992)'s measuring-out effect with internal arguments, they have usually been treated as a natural class. This paper shows that at least a certain subset of the third class—zero-derived denominal verbs—should also be treated as members of the Incremental Theme or Change of State classes.

On the l-syntactic approach of Hale and Keyser (1993 et seq.), the position of the nominal that forms the Root of the denominal verb, prior to incorporation, is identical to the position of certain unincorporated measuring-out arguments. Such roots may differ in properties that bear on measuring-out, such as inherent countness and massness. Consequently, we expect that different denominal verbs will have different Aktionsart properties, and that such properties will be reliably determined by the meanings of their roots, in the same way that these properties affect the Aktionsart of VP predicates with unincorporated measuring-out arguments. This turns out to be the case. On this analysis, however, we must assume that there are two crucially different types of denominal verbs in English: verbs whose names are derived via incorporation

of a Root from within the argument structure, producing the measuring-out effect, and verbs whose names are derived some other way, by a mysterious, parametrically varying, ill-understood process which I'll call *Manner Incorporation*

2 Background

Much recent work on telicity has turned on the important connection between the direct object position and the telicity of the VP, shown in Tenny 1992 and also Dowty 1991. The central observation is that in many VPs, the boundedness of the direct object determines the telicity of the event denoted by the whole VP complex, as illustrated by the *for*/*in* temporal adverbial tests in (1). A proposal that has gained substantial currency is that there is a functional projection which checks the boundedness features of the direct object to provide an aspectual interpretation for the VP, e.g. Borer 1996; van Hout and Roeper 1998, Ramchand 2001, among many others. This projection is sometimes conflated with the accusative case-checking projection, sometimes independent of it.

(1)
a.	Sue drank/wrote	for hours/#in 5 minutes.
b.	Sue drank a pint of beer/wrote a story	#for hours/in 5 minutes
c.	Sue drank beer/wrote stories	for hours/#in 5 minutes.
d.	Sue wrote at a story	for hours/#in 5 minutes

Other authors have called the importance of the direct object as a determiner of telicity into question, notably Jackendoff 1991; Jackendoff 1996 and also Levin 2000. There are verbs which take an overt, bounded, definite direct object and are yet inherently atelic ((2)a, c); they become telic when a goal argument is provided ((2)b, d).

(2) a. Sue pushed the cart — for an hour/#in an hour.
b. Sue pushed the cart to the field — #for an hour/in an hour.
c. Sue kicked the ball — for an hour/#in an hour
d. Sue kicked the ball to the center — #for a second/in a second

There is a similar set of unergative verbs of motion: they are essentially atelic, as is expected since they don't have a direct object, but, they may become telic with the addition of a goal PP (still without a direct object) illustrated in (3).

(3) a. Sue danced — for an hour/#in an hour.
b. Sue danced across the stage — #for five minutes/in five minutes.
c. Sue hopped — for an hour/#in an hour
d. Sue hopped across the stage — #for five minute/in five minutes

A third class of verbs of motion may be transitive as well as intransitive, but do not become telic until a goal PP is added:

(4) a. Sue walked — for an hour/#in an hour.
b. Sue walked the dog — for an hour/#in an hour.
c. Sue walked (the dog) to the park — #for 5 minutes/in 5 minutes.

With respect to verbs of motion, when motion appears to be spontaneous or internally caused, there is a well-known connection between tests for unaccusativity (*there*-insertion (5), and auxiliary selection(6)) and the presence of a goal PP, implying a connection between telicity and the object position:

(5) *There*-insertion:
a. The bullet whistled as it passed my ear.
b. *There whistled a bullet (as it passed my ear).

c. There whistled a bullet past my ear.

(6) Auxiliary selection in Dutch (Borer 1996)

a. Jan **heeft/*is** gesprongen.
Jan has/*is jumped
'Jan has jumped.'

b. Jan **is** in de sloot gesprongen.
Jan is in the ditch jumped
'Jan has jumped into the ditch' *where* 'in de sloot' *is a Goal, not a Location*

c. Jan **heeft** in de sloot gesprongen.
Jan has in the ditch jumped
'Jan has jumped (while) in the ditch.' *where* 'in de sloot' *is a Location, not a Goal*

This would seem to support a necessary connection between presence of an internal argument and telicity, as predicted by Measuring-Out treatments, but it is clear that it is the structural effect of the Goal PP, rather than the telicity it can provide, that is relevant for the unaccusativity tests. Consider the example in (7):

(7) Jan **is/*heeft** naar het bos gerend
Jan is/*has towards the woods run
"Jan has run towards the woods"

Although the unaccusative auxiliary selection indicates that the additional PP has indeed licensed an internal argument, the PP in question does not provide an endpoint, and the entire VP is atelic —that is, there is no necessary connection between the presence of the internal argument and telicity here. For a discussion of this class of verbs and its implications for treatments of Aktionsart, see Folli and Harley (2003).

A third class of atelic activity/semelfactive verbs with objects become telic only with the addition of a result phrase Rappaport Hovav and Levin 1998:

(8) a. Sue hammered the metal for 5 minutes/#in 5 minutes.
b. Sue hammered the metal flat #for 5 minutes/in 5 minutes.
c. #This metal hammers easily.
d. This metal hammers flat easily.

Again, the presence of the internal argument is apparently not the crucial factor in determining the Aktionsart of the VP.

Most theorists ascribe the distinction between Incremental Theme verbs and the verbs discussed above to an idiosyncratic property of the verbs themselves. For example, Van Hout (2000) says of these verbs, 'Following Dowty, Tenny, Krifka and Verkuyl, I take it that it is a lexical property of verbs that distinguishes the *push*-class from verbs like *drink* and *write*.' In this paper, I show that these two apparently distinct classes of verbs can be treated in a uniform way, assuming an l-syntactic approach. There is an important connection between the 'object' position and measuring-out, but there are other argument positions which can also produce a measuring-out effect, and in all cases such influence is exerted from the base-generated position of the relevant element, not from the specifier of a telicity-checking functional projection.

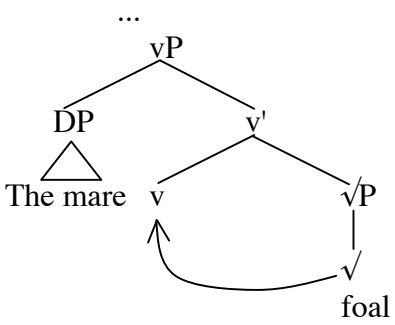
3 L-syntax and Measuring-Out

To begin to make the argument for such an approach, let's first consider a class of unergative verbs that, unusually for such verbs, denote Accomplishments. These are Hale and Keyser's denominal verbs of birthing, illustrated in (9).

(9) a. The mare foaled #for 2 hours/in 2 hours
b. The dog whelped #for 2 hours/in 2 hours
c. The cow calved #for 2 hours/in 2 hours.

Hale and Keyser (1993) propose that these verbs (as well as unergative verbs in general) are essentially transitive, derived by incorporating a noun root in object position into the transitive 'light' verb that selects it; that is, by conflating a transitive structure. The l-syntax of a verb like *foal* is illustrated in

(10) L-syntax for unergative verbs of birthing:



"The mare foaled"

This treatment of *foal* as having an underlying direct object, which incorporates into the transitive verb, is inspired by the more-or-less equivalent transitive paraphrases: *The mare had a foal, The mare bore a foal*, etc. The transitive paraphrase is telic, as illustrated in (11), and it seems natural to think of the object in the paraphrase as an Incremental Theme, measuring-out the event of birthing via an event-object homomorphism in the sense of Krifka (1998).

(11) The mare bore a foal in 2 hours/#for 2 hours.

If Hale and Keyser are right about the structure of denominal verbs of birthing, then the root √*foal*, underlyingly in object position, should measure-out the event of *foaling*. Consequently, the Aktionsart properties of *bear a foal* should be similar to the properties of *foal*, at least if the Root √*foal* is itself inherently delimited, which seems plausible. In fact, the verb *foal* does have the same telicity as *bear a foal* (12):

(12) The mare foaled in 2 hours/#for 2 hours

One data point does not a generalization make, however. To confirm that the Root is measuring-out in the same way that an overt direct object does, we need to contrast these unergative verbs (having delimited incorporated Roots) with some which have inherently non-delimited Roots, which should produce an atelic unergative verb. A good candidate for an inherently non-delimited nominal Root is a mass noun, like *water*. There are a few such mass nouns which are the basis for unergative denominal verbs in English. These are verbs of bodily emission of fluids (as opposed to babies), such as *drool, sweat,* and *bleed*, where the mass Roots on which the verbs are based start out in object position and then are incorporated, employing exactly the same structure as for *foal* in (10) above. As the l-syntax analysis predicts, the unergative verbs which result from incorporating a mass noun from object position are atelic, illustrated in (13), in exactly the same way that their transitive paraphrases in (14) are.

(13) a. The baby drooled for 2 hours/#in 2 hours
b. The athlete sweated for 2 hours/#in 2 minutes
c. The wound bled for 2 minutes/#in 2 minutes

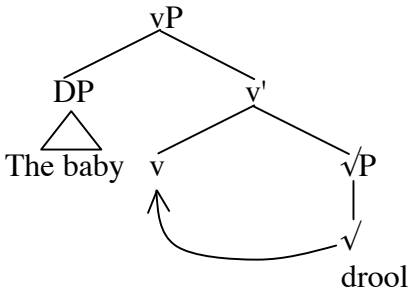
(14) a. The baby made drool for 2 hours/#in 2 hours.
b. The athlete made sweat for 2 hours/#in 2 hours.

c. The wound oozed/made blood for 2 minutes/#in 2 minutes.

If the denominal verbs in (13) have the structure illustrated in (15) below, and if the roots √*drool*, √*sweat* and √*bleed* are inherently non-delimited, then again, the correspondence in Aktionsart between the transitive paraphrases and the unergative verbs is predicted by the l-syntactic approach.[1]

(15) L-syntax for unergative verbs of bodily emission of fluids:

...



"The baby drooled"

There is even one verb of birthing with an non-delimited nominal Root, pointed out to me by Paul Kiparsky: *spawn*. This verb forms a minimal pair with the other verbs of birthing: it produces a (potentially) atelic birthing event, in contrast to those with delimited nominal Roots like *foal* above:[2]

[1] The verb *spit* is an apparent problem. In its nominal form, it is definitely a mass noun (*some spit* vs. *#two spits*). However, the verb seems to be a semelfactive unergative in its behavior (see below). I will consider it to be naming an event (the act of spitting) rather than a thing, and treat it like *jump* or *knock*.

[2] There is a telic reading available for this verb as well: *The female salmon spawned in 30 minutes*. Similarly, the verb of bodily emission *pee*, which does have an atelic reading as predicted by its non-delimited nature (*John peed for five minutes*), also has a telic reading available: *John peed in five minutes*. I assume that the telic reading is coerced into existence by pragmatic/real-world knowledge: the internal container of pee and spawn in the relevant

(16) The female salmon spawned for 30 minutes.

To sum up the observations of this section: in the paraphrases in (11) and (14), we attribute telicity or lack of it to the mass or count properties of the incremental theme in direct object position. In the corresponding unergative verbs, according to the l-syntax hypothesis, the verbs are derived via incorporation of a nominal root from direct object position which has inherent mass or count properties. The l-syntax hypothesis makes it possible to attribute the parallel telicity properties of the unergative verbs and their transitive paraphrases to the same mechanism, which creates an event-object homomorphism between an event and the element which is *underlyingly* in direct object position. It is not, however, important for the underlying direct object to check any features in the specifier of a telicity-sensitive functional projection; whatever mechanism produces the event-object homomorphism depends on the underlying position of the object, not to features that the object may or may not check (on its way to) its surface position.

3.1 Denominal unergatives with Event roots

So far, we have investigated two types of Roots: Roots that denote Things that are either delimited or non-delimited (henceforth we will use Jackendoff (1991)'s terminology and call them *bounded* or *unbounded*). A bounded Root in direct-object position gives us telic predicates, measured out by the bounded Root, just like any other Incremental Theme, while unbounded

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organisms is quite saliently delimited, and can be easily treated as such at a post-syntactic level by the Universal

Roots in complement position result in atelic predicates. We can sum up the typology of roots so far as follows:

(17)

Boundedness value Referent of √	bounded	unbounded
Thing	foal	drool

Hale and Keyser proposed the same l-syntactic structures for other denominal unergative verbs, in particular, unergative verbs with Roots which name Events, like *run, dance, jump, whistle*, etc. In (18) and (19), we see that denominal unergatives with Event-naming roots cannot be telic, unlike the verbs of birthing above. Rather, they are either activities, as in (18), or instantaneous events, as in (19), which may be coerced to a repetition reading when they occur with an atelic frame adverbial. Following Smith 1991, I'll call the latter *semelfactives*.

(18) Activities

a.	Sue danced	for 5 minutes/#in 5 minutes
b.	Sue whistled	for 5 minutes/#in 5 minutes
c.	Sue slept	for 5 minutes/#in 5 minutes

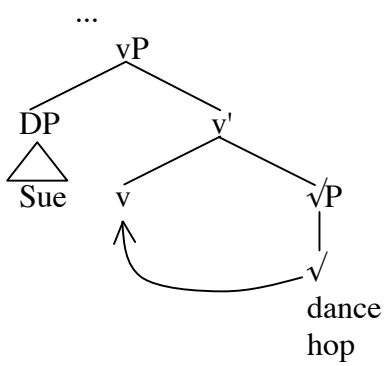
(19) Semelfactives

a.	Sue hopped	#for 5 minutes/#in 5 minutes
b.	Sue tripped	#for 5 minutes/#in 5 minutes
c.	The light flashed	#for 5 minutes/#in 5 minutes

H&K's proposed structure for such verbs are represented in (20) below:

Packager. For this paper, the crucial piece of evidence is the availability of an *atelic* reading for these verbs.

(20) L-syntax for unergative verbs of activity:



"Sue danced/hopped."

Again, Hale and Keyser intended these to have semantic properties similar to those of their paraphrases, such as *do a dance* and *do a hop*, and, again, in (21) below, we see that the same Aktionsart properties hold of the unergative and its transitive paraphrase:

(21) a. Sue danced for 5 minutes/#in 5 minutes
b. Sue did a dance for 5 minutes/in 5 minutes
c. Sue hopped #for 5 minutes/#in 5 minutes
d. Sue did a hop #for 5 minutes/#in 5 minutes

Note the one difference in the paraphrases: "dance" in its nominal form is a count noun, and a measured-out telic reading is available for the transitive paraphrase in 20(b). As with *spawn* and *pee* (see footnote 2 above), the important thing to notice is that *do a dance* does allow an atelic reading, indicating that it may be interpreted unboundedly.

I assume that the distinction between *dance* and *hop* is the same as the distinction between *drool* and *foal*, that is, *dance* is an unbounded Root and *hop* is a bounded one. There is a crucial difference between bounded Things and bounded Events, however: bounded Event roots do not result in an Accomplishment interpretation of the vP that they occur in. They name an event that occurs at a point in time, not one that evolves over time. In the case of the bounded Thing roots, the measuring-out occurs over the physical quantity of the bounded Thing(s) in question. I hypothesize, following Pustejovsky 1991 and Jackendoff 1991 that while bounded Things must necessarily take up a certain amount of space, linguistic Events are fundamentally either pointlike (instantaneous) or extend arbitrarily long (activities). Events which unfold over time and then culminate—Accomplishments—are made up of two (sub-)Events, rather than just one (again following Pustejovsky 1991). Monomorphemic Event-naming Roots like (*a*) *run* or (*a*) *jump*, therefore, can only name events that are instantaneous or arbitrarily long. When a pointlike Event Root occurs in direct object position, the measuring-out effect—the event-object homomorphism—therefore produces a pointlike meaning for the vP containing it. The typology of Roots we have considered so far, then, is seen in the table in (22):

(22)

Boundedness value Referent of √	bounded	unbounded
Thing	*foal*	*drool*
Event	*hop*	*dance*

In sum: we have seen that, in H&K's l-syntactic account, all unergative verbs are created by incorporating a nominal root into a light verb. The telicity of the resulting verb can be predicted on the basis of the ontological category of the root (Event or Thing), and whether that root

denotes a bounded or an unbounded entity, by assuming that an event-object homomorphism is established which determines the Aktionsart of the vP. Incorporating a bounded Thing Root produces an Accomplishment, since the homomorphism will measure-out the event according to the inherently finite spatial extent of the Thing in question. Incorporating an unbounded Thing or Event Root produces an Activity, since the homomorphism measures-out the event according to the inherently infinite extent of the Event or Thing named by the Root. Finally, incorporating a bounded Event Root produces a Semelfactive, since the homomorphism will peg the unfolding of the event identified by the vP to the punctual nature of the Event named by the Root.

3.2 Transitive atelic and semelfactive verbs

Recall one of our classes of problem verbs from section 2 above, exemplified by *push, hit* and *kick*. They have a 'non-affected' object which cannot measure out. In the past, this has been attributed to Tenny (1992)'s Affectedness Condition, which governs the application of mapping rules. Since these are non-affected direct objects, the reasoning goes, they do not create the object-event homomorphism effect and do not behave like Incremental Themes.

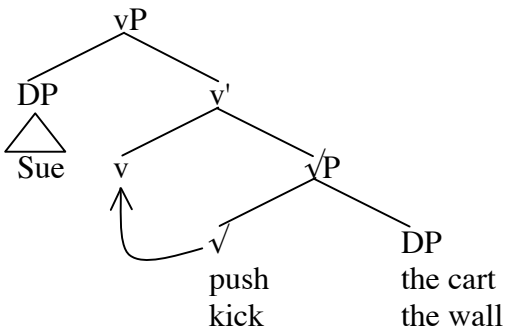
(23) a. John pushed the cart — for 5 minutes/#in 5 minutes
b. Sue drove the car — for 5 minutes/#in 5 minutes
c. Sue kicked the wall — #for 5 minutes/#in 5 minutes
d. A bird pecked Sue — #for 5 minutes/#in 5 minutes

The Affectedness Condition is famously problematic to make precise; for instance, in *A bird pecked Sue*, above, my intuitive feeling is that *Sue* is considerably more affected by the event than is *the book* in *Sue read the book*; nonetheless the latter is an Incremental Theme while the

former is not. Further, such verbs create a problem for the structural characterization of the application of the event-object homomorphism that was so useful to us above. If the objects of these verbs are in the same structural position as the objects of verbs of creation and consumption, or as the roots of the unergative verbs discussed above, then we expect an event-object homomorphism to be possible in these cases.

Hale and Keyser's l-syntax makes possible a potential account of such verbs. Notice that these verbs themselves are denominal, formed on a monomorphemic Event-denoting Root: *a push, a drive, a kick, a peck*. If Event-denoting roots can select for a complement, we can group these together with the unergative verbs with Event-denoting roots in (18) and (19) above. Note that they have the same range of Aktionsart properties: they are all either Activities or Semelfactives. This would then entail that they have the structure in (24) below:

(24) ...



The DP which ultimately ends up checking accusative case, then, is *not* in the base-generated direct-object position of the verb. That position—sister to *v*—which is the event-object homomorphism producing position, is occupied by √P, whose boundedness properties are those of the Root. Since the root names an Event, then, the homomorphism mechanism will produce a punctual semelfactive like *kick* or an activity like *push*.

If Roots can take a complement, then one expects to see complement-taking denominal Roots which denote Things, as well as Events. Potential examples seem very hard to come by, however. Let us suppose that, in general, Roots denoting Things cannot select arguments[3], for some as yet mysterious reason, while Event-naming Roots can do so. Our inventory of basic Root properties now looks like this:

(25)

	no complement		complement	
	bounded	unbounded	bounded	unbounded
Event	*hop*	*sleep*	*kick*	*push*
Thing	*foal*	*drool*	N/A?	N/A?

The reason, then, that the surface objects of these verbs cannot measure out, is that they in fact occupy a derived 'object' position—they check Accusative Case, but do not occupy the sister-to-*v* position that licenses the event-object homomorphism. The underlying sister-to-v, which determines the Aktionsart of the vP, is the projection of the Event-denoting nominal Root which incorporates into *v* to produce the verb itself.

3.3 Change-of-State verbs

Above, we have considered the structures which result when a nominal Root is directly incorporated into a verb. In such cases, it is the nature of the Root itself which determines the Aktionsart properties of the verb. In another class of structures, the Aktionsart of the verb is

[3] Maybe. What about *Bill fathered a son* (*?in 2 years/#for 2 years*).

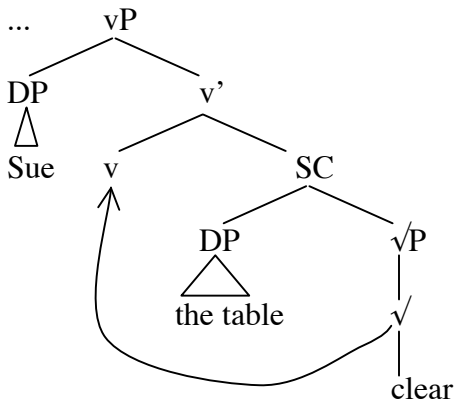
determined by the degree to which some State is true of the Theme of the verb. These are, of course, the change-of-state verbs, usually deadjectival, illustrated in (26) below:

(26) Deadjectival change-of-state verbs

a.	Sue cleared the table	#for 5 minutes/in 5 minutes.
b.	The archaeologist opened the sarcophagus	#for 5 minutes/in 5 minutes
c.	Sue tamed the lion	#for 5 minutes/in 5 minutes

These verbs appear to have a very straightforward semantic analysis in terms of CAUSE + STATE. In the syntax, the STATE is represented by a small clause (SC) consisting of the adjectival state predicated of the object. Some undergo the inchoative/causative alternation (via a change in the *v* which selects for the SC), some do not. The SC structure for such verbs is illustrated in (27):

(27)



'Sue cleared the table'

Here, the surface object DP is in what H&K call the 'inner subject' position.[4] It itself does not 'measure-out'. Rather, as was the case above, the constituent in the sister-to-*v* position is the thing that is subject to the homomorphism effect, i.e. the Small Clause itself. In these cases, the measuring-out is with respect to the entire *state* denoted by the small clause — the degree to which the table is *clear*. When that state is achieved, the accomplishment denoted by the whole construction is over. Note that the whole is constructed from two eventualities: the CAUSE event (little v), and the (END)STATE event (the small clause). This has the nice property of making syntactically explicit the semantic decomposition of accomplishments proposed by Pustejovsky (1991) and others.

There do seem to be complement-taking State-denoting roots: contrast the deadjectival change-of-state verbs and their resultative paraphrases in (28) and (29) below:

(28) a. Jill cleared the table (of dishes).
b. Jill swept the table clear (of dishes).
c. Jill emptied the box (of marbles)
d. Jill made the box empty (of marbles).

(29) a. Jill flattened the metal (#of bumps)
b. Jill hammered the metal flat (#of bumps).
c. Jill roughened the surface (#of scratches).
d. Jill made the surface rough (#of scratches).

The States in (28) seem happy to take a complement, while those in (29) do not. Further, there do seem to be bounded and unbounded States. Weschler (2001, this volume) shows that adjectival resultatives can only be formed on selected objects with closed-scale adjectival

[4] Hale and Keyser actually propose a more complicated representation than this, where the predication of the small clause is not direct, but is rather mediated by a lower V head, rather like Bower's (1993) or Baker (2003)'s PredP.

predicates (30), although both closed-scale and open-scale adjectival predicates can form change-of-state deadjectival verbs (31):

(30) a. Jill wiped the table clean.
b. #Jill wiped the table dirty
c. Jill hammered the surface flat.
d. #Jill hammered the surface rough. (on a resultative, not a depictive, reading).

(31) a. Jill cleaned the table.
b. Jill dirtied her face.
c. Jill flattened the surface.
d. Jill roughened the surface.

The closed-scale/open-scale distinction may represent the [±bounded] feature applied to (scalar) State-denoting Roots. Deadjectival verbs based on [-bounded] State Roots, then should be at least potentially atelic, and indeed, that has been claimed in the literature (Hay, Kennedy and Levin 1999), based on examples like the following (note the paraphrases):

(32) a. Bill lengthened the rope for 5 minutes.
b. (Bill made the rope longer for 5 minutes)
c. The storm lessened for 5 minutes.
d. (The storm became less for 5 minutes)

If that's so, then we have the following table of possible Root meanings:

(33)

	no complement		complement	
	bounded	unbounded	bounded	unbounded
Event	*hop*	*sleep*	*kick*	*push*
Thing	*foal*	*drool*	N/A?	N/A?
State	*flat*	*rough*	*clear*	??

One final note concerning deadjectival change-of-state verbs. There does appear to be an event-object homomorphism at work in these cases, since changing the object of such a verb from a count to a mass noun, or from a singular to a plural noun, affects the telicity of the entire event in a familiar way, as illustrated in (34);

(34) a. Jill flattened the piece of tinfoil in 5 minutes/#for 5 minutes.
b. Jill flattened tinfoil #in 5 minutes/for 5 minutes.
c. Jill cleaned the dish in 5 minutes/#for 5 minutes.
d. Jill cleaned dishes #in 5 minutes/for 5 minutes

In this case, however, unlike with the verbs of creation or destruction, or the unergative verbs, discussed above, the effect of the boundedness of the object on the boundedness of the event is only indirect. Changing the boundedness of the object in deadjectival change-of-state verbs changes the status of the small-clause State which is the actual delimiter of the event: it changes the amount of stuff to which the state has to apply in order for the event to be complete; formerly it was a bounded amount of stuff, but when pluralized it is an unbounded amount. Consequently the State denoted by the small clause changes from bounded to unbounded. The required homomorphism between the vP event and the *v*'s SC sister, the State, means that the entire vP's Aktionsart changes. We will see a similar indirect effect at work in prepositional-phrase complements to *v* in the next section.

So far, then, we have seen the l-syntaxes of unergative, semelfactive, and change-of state verbs, and asserted that a homomorphism is established between the *v* and its sister, whether that sister is a √, a √P, or a SC. There is one major class of denominal verbs dealt with by Hale and Keyser that we have not yet considered, however: the *location/locatum* verbs. We turn to these in the next section.

4 Denominal Location/Locatum verbs

Besides the denominal unergative verbs discussed in section 3.1 above, Hale and Keyser propose an l-syntactic structure with incorporation of a nominal root for a large class of transitive denominal verbs, called *Location* and *Locatum* verbs. Some examples of each are given in (35) and (36) below; for more such verbs and important discussion, see Kiparksy (1997):

(35) 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.

(36) 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.

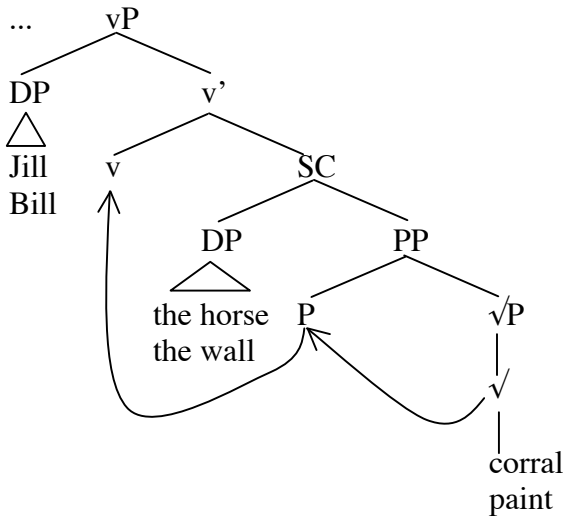
Hale and Keyser propose that the same l-syntactic structure is the source of all such verbs. In essence, these are a subcase of the SC deadjectival cases above, except that instead of an adjectival predicate, the SC predicate is prepositional, denoting a change in the relative positions of the Inner Subject and some other entity, the Location/Locatum argument. They give paraphrases of the form in (37) and (38) below, illustrating in overt syntax the underlying structure they propose for verbs like *bag, corral, saddle* and *paint*:

(37) a. Bill put the snake in the bag.
b. Bill bagged the snake.
c. Jill herded the horse into the corral.
d. Jill corralled the horse.

(38) a. Jill fit the horse with a saddle.
b. Jill saddled the horse.
c. Bill smeared the wall with paint.
d. Bill painted the wall.

Note that although the objects of the prepositions in (37) are Locations and those in (38) are Locatums, (i.e. in (38) the object of the preposition is moving relative to the Inner Subject, while the reverse is true in (37)), the structure of the paraphrases, and the l-syntactic structures, that H&K propose for these verbs are identical. The structure is in (39) below:

(39)



'Jill corralled the horse'
'Bill painted the wall'

The abstract preposition, according to H&K, is a 'relational element' which establishes a meaningful link between the DP and the √P; they distinguish between a P of 'central coincidence' and a P of 'terminal coincidence', although it seems likely to me, following Mateu (2001), that the distinction is unnecessary in these instances.[5] One can identify a location or

[5] Kiparsky (1997) points out that when the incorporated nominal is both a plausible Location and a plausible Locatum, both readings are often possible:

locatum based on external, Encyclopedic knowledge, and it may well be superfluous to encode the distinction in the grammar.

Is there any way that we can test the structural validity of this proposal? If the line of reasoning proposed above is correct, the structural consequences of the l-syntax should mean that things which affect the Aktionsart of the paraphrases of these verbs should carry over to the verbs themselves, since their l-syntax is equivalent to their paraphrases'.

First, just as in the deadjectival cases, above, changing the number of the Inner Subject affects the measuring-out properties of the prepositional Small Clause (40), and, as we expect, changing the number of the direct object of the paraphrase has an identical effect (41)

(40)
a. John saddled the horse — #for 5 minutes/in 5 minutes
b. Sue boxed the computer — #for 5 minutes/in 5 minutes
c. Mom blindfolded a 6-year-old — #for a minute/in a minute.
d. John saddled horses — for 5 minutes/#in 5 minutes
e. Sue boxed computers — for 5 minutes/#in 5 minutes
f. Mom blindfolded children — for 5 minutes/#in 5 minutes.

(41)
a. Mom fit the six-year old with a blindfold — #for 5 minutes/in 5 minutes.
b. Mom fit children with a blindfold — for 3 hours/#in 3 hours.
c. Sue put the computer in a box — #for 5 minutes/in 5 minutes.
d. Sue put computers in a box — for 5 minutes/#in 5 minutes.

This is the same phenomenon as in the deadjectival cases, and so not surprising. If we look a little more closely at the paraphrases, however, we find that the Aktionsart of the vP is sensitive to changes in the number or mass/countness of the *indirect* object as well—changing the plurality or massness of the object of the preposition also affects the overall telicity of the paraphrase (42);

(i) John indexed the book (=location: put the book in an index)

(42) a. Sue put the computer in boxes for 5 minutes/#in 5 minutes
b. Sue fit the horse with saddles for an hour/#in an hour.

Although these are pragmatically odd (involving repeatedly doing something to the same computer or horse), manipulating the boundedness of the prepositional object does affect the aktionsart of the predicate. If, in verbs like *corral* and *paint*, the nominal roots of the verbs originate in the same position as the objects of the prepositions in (42) above, then we ought to be able to predict the telicity of such verbs by noticing whether the incorporated Thing-denoting Root is inherently bounded or inherently unbounded, exactly as we did with the unergative verbs *foal* and *drool* above. In fact, this turns out to be the case. When the incorporated Root is a bounded Thing, as in (43) below, the location/locatum verb must be telic. When it is an unbounded Thing, however, as in (44) below, the verb may be atelic.

(43) a. John saddled the horse #for 5 minutes
b. Sue boxed the computer #for 5 minutes
c. Mom blindfolded a 6-year-old #for a minute

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

To recap: we attribute the introduced atelicity of the paraphrases in (42) to the introduced unboundedness of the prepositional object. Similarly, we can explain the available atelicity of *to paint* in contrast to the necessary telicity of *to saddle* by attributing it to the unboundedness of the incorporated nominal Root in *paint,* vs. the boundedness of the incorporated nominal Root in

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(ii) John indexed thebook (=locatum: provided the book with an index).

saddle. The same interpretive mechanism, applied to the same underlying structure, will account for the Aktionsart properties of both sets of sentences.

5 Implications, speculations

There is one major class of denominal verbs not discussed by Hale and Keyser which does not fit into the picture sketched above in the least. These are Activity verbs named after the instrument used to accomplish them, illustrated in (45) below:

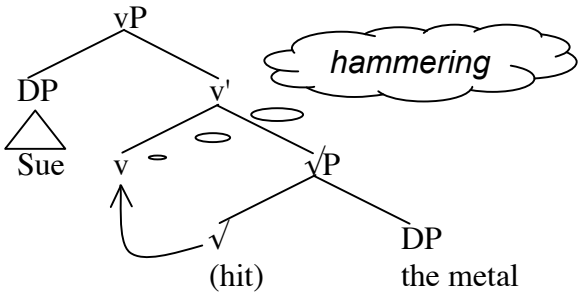
(45) a. John hammered the metal for 5 minutes/in 5 minutes
b. Sue brushed the dog for 5 minutes/in 5 minutes
c. Jill raked the leaves for an hour/in an hour

Notice that the (necessary) boundedness of the nominal Root here (*brush, hammer, rake*) has no effect on the potential atelicity of the vP. Given the picture presented above, this means that the source of these denominal roots cannot be within the argument structure of the vP, either as sister to *v*, or in the Inner Subject or prepositional object positions of a Small Clause, since elements originating in any of these positions *do* affect the telicity of their vPs. Considering the thematic role of the incorporated nominal in these examples, this makes sense: these incorporated nouns are neither Themes nor Location/Locatums, but rather Instruments. Instrumental phrases, in the overt syntax, are adjuncts to vP, not arguments of it. Good paraphrases of these sentences might look something like this:

(46) a. With a hammer, John hit the metal.
b. Sue stroked the dog with a brush.
c. Jill pushed the leaves with a rake.

How can an element conflate with *v* from an adjunct position? While I do not pretend to understand how this can happen, since it runs counter to the assumption that incorporation of Roots in l-syntax is governed by the same principles that restrict head-movement in the overt syntax, it seems clear that some mechanism must be proposed which has exactly this effect. As a first pass, I propose to name this mechanism "Manner Incorporation". Via Manner Incorporation, a *v* may be named by a Root describing the Manner in which it is accomplished. Assuming that all adjuncts, including Instrumental ones, are a species of Manner, these denominal verbs represent an occurrence of Manner Incorporation applying to an l-syntactic structure that would normally give rise to a verb of contact, involving a complement headed by an Event-denoting Root. For want of a better notation, I provisionally represent the effects of Manner Incorporation via a 'thought balloon' applying to the *v*.

(47) ...

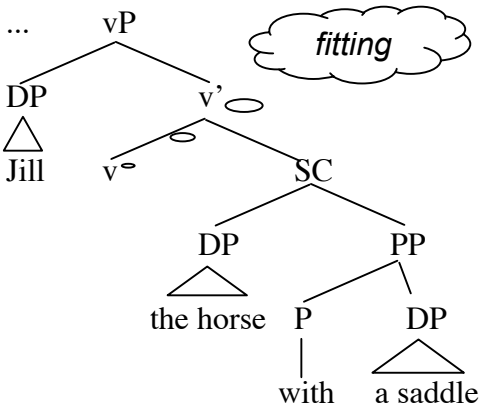


'Sue hammered the metal'

The idea is that in English, at least, *v* can pretty freely be named after a Manner, instead of being named by the more usual head-movement mechanism which allows *v* to get its name via

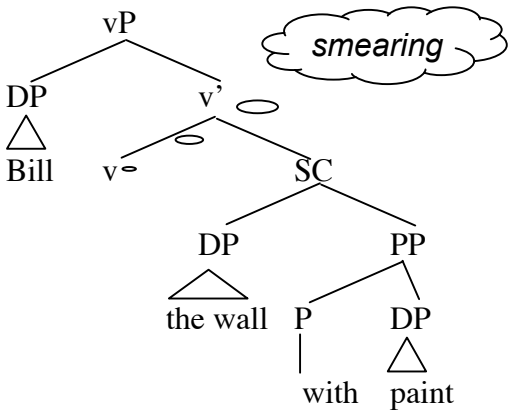
incorporation of a Root from lower in the argument structure. Manner Incorporation is how the verbs in H&K's paraphrases presumably get their names, as in the illustrations below:

(48) a.



'Jill fit the horse with a saddle'

b.



'Bill smeared the wall with paint'

This notion that verbs in English can be named after the manner in which they are accomplished, assuming that Encyclopedic considerations can be accomodated, has implications for the treatment of resultative constructions in English. For instance, when one adds a resultative PP to a verb like *push*, as in *John pushed the cart to New York*, the argument structure is suddenly changed from that of an incorporated Event-denoting, complement-taking Root to a prepositionally-headed Small Clause, as indicated by the paraphrases in (49)below, where DO and CAUSE are glosses of the approximate content of the *v* in the construction:

(49)	a.	John pushed the cart	John DO [$_{\sqrt{P}}$(a) √push (of) the cart]
	b.	John pushed the cart to New York	John CAUSE [$_{SC}$ the cart to New York]

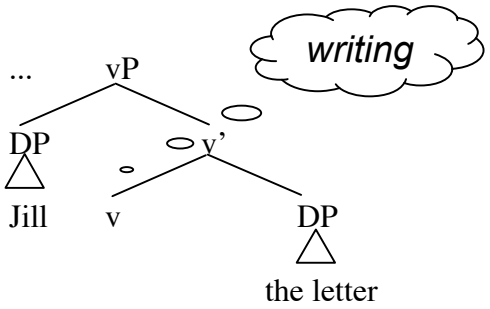
In (49b), there's no room for the *√push* event nominal in the argument structure of the vP, which is now saturated with a State complement complete with an internal subject (*the cart*) and a predicate (*to New York).* 'Pushing' is now relegated to a mere Manner element, which is used as

a pronunciation for the *v* via Manner Incorporation.[6] A good paraphrase would be something like *John caused the cart (to go) to New York by pushing*. Consequently, a *v* may get the same name (*push*) via two distinct processes, depending on the argument structure of the vP. For an extended discussion of this type of phenomenon, see Mateu and Rigau (2000) and Folli and Harley (2003), including an exploration of the notion that the availability something like Manner Incorporation may vary parametrically, providing an account of the absence of resultatives and goal-of-motion constructions in the Romance languages generally (cf. Talmy 1986).

In fact, it is this process which gives us the names of verbs of creation, consumption and destruction quite generally. Recall that above, we proposed that unergative verbs like *foal* and *drool* have an underlyingly transitive structure, and that the Thing-naming Root in sister to *v* position measured-out the event of *foaling* or *drooling* via the same event-object homomorphism that is at work in *Jill wrote the letter* or *Bill ate the muffin*. In order to maintain the notion that the event-object homomorphism arises between *v* and its sister, *Jill wrote the letter* must have the same structure as *The mare foaled*—it must be the equivalent of a 'paraphrase' of that structure, including a manner element—something like *Jill created the letter by writing*, as illustrated in (50) below:

[6] The same process is at work in Gleitman (1990)'s example of the independent meaning supplied by the ditransitive frame. If you take a verb like *think*, which usually takes only a CP or DP complement, and force it into a ditransitive frame — *Sue thought the book to Mary* — what results is not ungrammaticality. Rather, we interpret thinking as a manner element describing the way in which the book was transferred to Mary (telepathically or telekinetically, probably). Cf. also the insights of construction grammar: Goldberg 1995.

(50)



'Jill wrote the letter'

An interesting phenomenon, discussed at length by Kiparsky (1997), is that there seem to be idiomatic effects which restrict or enlarge the interpretation of l-syntaxes with conflation that are not in effect in the corresponding paraphrases with Manner Incorporation. For instance, in *Jill corralled the horse*, she can be understood to simply have cornered the horse in any enclosure, not necessarily a corral, but in *Jill put the horse in a corral*, the corral must be a literal corral. Similarly, verbs of creation with conflation in English are restricted to cases where the subject is creating the Theme in an inalienable way, usually 'out of' the subject's own body. Hence one can say *Jill drooled* but not *Jill caked*, meaning 'Jill made a cake'. Without conflation, however, there is no such restriction on verbs of creation, despite their identical structure; consequently *Jill made a cake* or *Jill wrote a letter* are fine. I don't understand this phenomenon, but it clearly goes hand in hand with the restrictions on the productivity of at least some l-syntactic configurations, and deserves further investigation.

One final remark: some 'manner' names are so 'light' as to be almost meaningless. Such verbs are often provided as glosses of *v* in various environments; examples in English include 'do', 'make', and 'cause'. Each has its own preferential environment of insertion; *do* generally is used as a neutral realization of *v* when its complement is an Event, hence *do a dance, do work,* etc. When the complement of *v* is a Thing, *make* is a fairly unmarked realization of the content of

v, as in *make a cake, make a letter*, etc. Finally, *make* or *cause* is often used when the complement to *v* is a State, as in *make Bill sick* (cf. *sicken Bill*) or *cause the table (to be) clear* (cf. *clear the table*). As should be clear by now, I consider that it's the same little *v* in all cases: one that denotes the beginning of an event, and its initiator. It's just a weakness of English there is no single 'manner' verb that can spell out *v* in all three environments. We make Things, we do Events, and we cause states, but in French, for example, all three English verbs translate the same way: *faire*.

6 Concluding remarks

In this paper, I have presented evidence that the structural effects of Hale and Keyser's l-syntax make correct predictions concerning the effect of Root type on the Aktionsart of denominal verbs, if Roots are inherently specified as bounded or unbounded. Assuming the correctness of this type of approach, I explored its consequences for the ontology of Root types, concluding that there are at least Roots which name Events, Things and States, and bounded and unbounded, and complement-selecting and non-complement-selecting, varieties of each. Finally, I considered the implications of the approach for other spell-outs of *v*, concluding that there must be a fairly unrestricted, non-structure-dependent process of *v* naming available in English, which I called Manner Incorporation.

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