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How Do Verbs Get Their Names? Denominal verbs, Manner Incorporation, and the Ontology of Verb Roots in English

HEIDI HARLEY

3.1 Introduction: Re-sorting aspectual classes

Discussions of Aktionsart and verb class generally distinguish three types of eventive VP: 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 (1992a)'s measuring-out effect with internal arguments, they have usually been treated as a natural class. This chapter 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 (e.g. 1993), 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 boundedness. 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 such 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 verb 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 shall call 'Manner Incorporation'.

3.2 Background

Much recent work on telicity has turned on the important connection between the direct object position and the telicity of the VP, as discussed in Verkuyl (1972), Dowty (1979; 1991), and Tenny (1992a), among many others. 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) (Vendler 1957). 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 1998; 2002; van Hout 1996). This projection is sometimes conflated with the accusative case-checking projection, sometimes independent of it.

(1) a. Sue drank/wrote   for hours/#in five minutes.

  b. Sue drank a pint of beer/wrote a story   #for hours/in five minutes

  c. Sue drank beer/wrote stories   for hours/#in five minutes.

  d. Sue wrote at a story   for hours/#in five minutes

   Other authors have called into question the importance of the direct object as a determiner of telicity, notably Jackendoff (1991; 1996) and Levin (2000). There are verbs which take an overt, bounded, definite direct object and are yet inherently atelic (2a, c); they become telic when a goal argument is provided (2b, 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 do not 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 five minutes/in five 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 1998)

    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 Italian examples in (7):

(7)   a. Gianni è corso   verso   il bosco.
          Gianni is run   towards   the woods.
          'Gianni ran towards the woods.'

      b. Gianni è scivolato   in direzione   della pianta.
      J. is slid   in the direction   of the tree.
          'Gianni slid in the direction of the tree.'

Although the unaccusative auxiliary selection (*è* 'is', as in the Dutch example in (6)) indicates that the additional PP has indeed licensed an internal argument, the PP in question in these examples does not provide an end-point, and the entire VP is atelic. Similarly, atelic PPs like *towards* and *around* license causatives of manner-of-motion verbs in English, despite the atelicity of the entire event, as shown in (8):

(8)   a. John waltzed Matilda around and around the room for hours.

      b. John walked Mary along the river all afternoon.

Facts like these show that 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):

(9)   a. Sue hammered the metal   for five minutes/#in five minutes.

      b. Sue hammered the metal flat   #for five minutes/in five minutes.

      c. #This metal hammers easily.

      d. This metal hammers flat easily.

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

   Most theorists have ascribed the distinction between Incremental Theme verbs and the verbs discussed above to an idiosyncratic property of the verbs themselves. For example, van Hout (2000a) 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*.' Here, I show that these two apparently distinct classes of verb can be treated in a uniform

way, assuming an l-syntactic approach. There is an important connection between the 'object' position and measuring-out, as well as other argument positions which can also produce a measuring-out effect. The crucial claim here is that in all cases the influence of the measuring-out argument is exerted from its base-generated position, and hence can even be seen in cases where the measuring-out argument is incorporated into the verb. A corollary of the central claim, then, is that the measuring-out argument cannot be exerting its influence from the specifier of a telicity-checking functional projection. The overall view here is thus very much in the spirit of Hale and Keyser's conclusion in this volume, that '[inner] aspect is orthogonal to argument structure'. It is the interaction of the meanings of their constituents and their syntactic argument structure which determines the Aktionsart properties of predicates; it is not the Aktionsart properties of predicates which determine their argument structure.

3.3 L-syntax and Measuring-Out

To begin to make the argument for such an approach, let us 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 (10).

(10)   a. The mare foaled   #for two hours/in two hours.

       b. The dog whelped   #for two hours/in two hours.

       c. The cow calved   #for two hours/in two hours.

   Hale and Keyser (e.g. 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—i.e. by conflating a transitive structure. The l-syntax of a verb like *foal* is illustrated in (11):

(11) L-syntax for unergative verbs of birthing[1]:
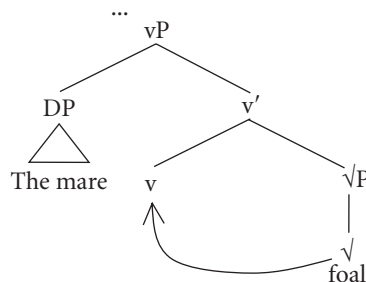
'The mare foaled.'

[1] Here and elsewhere in the paper the TP/CP functional superstructure is omitted from tree diagrams since it is not immediately germane to the point at hand; I assume, however, that any fully inflected sentence like 'The mare foaled' contains a full complement of such functional structure.

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 (12), 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).

(12) The mare bore a foal   in two hours/#for two 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* (13):

(13) The mare foaled   in two hours/#for two 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 (11) above. As the l-syntax analysis predicts, the unergative verbs which result from incorporating a mass noun from object position are atelic, illustrated in (14), in exactly the same way that their transitive paraphrases in (15) are.

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

(15) a. The baby made drool   for two hours/#in two hours.
      b. The athlete made sweat   for two hours/#in two hours.
      c. The wound oozed/made blood   for two minutes/#in two minutes.

If the denominal verbs in (14) have the structure illustrated in (16) 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.[2]

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

'The baby drooled'
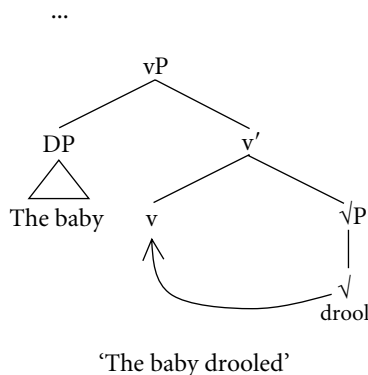
There is even one verb of birthing with a non-delimited nominal Root, pointed out by Paul Kiparsky: *spawn.* This verb forms a minimal pair with the other verbs of birthing: it produces a (potentially) atelic birthing event, in contrast to those with delimited nominal Roots like *foal* above:[3]

(17)   The female salmon spawned for thirty minutes.

To sum up the observations of this section: in the paraphrases in (12) and (15), 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 homo-

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[2] 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 behaviour (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*.

There is a telic reading available for this verb as well: *The female salmon spawned in thirty 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 organisms is quite saliently delimited, and can be easily treated as such at a post-syntactic level by the Universal Packager. For this paper, the crucial piece of evidence is the availability of an *atelic* reading for these verbs.

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

morphism 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 on features that the object may or may not check (on its way to) its surface position.

3.3.1 *Denominal unergatives with Event roots*

So far, we have investigated two types of Root: 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 Roots in complement position result in atelic predicates. We can sum up the typology of roots so far as follows:

(18)

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 (19) and (20), 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 (19), or instantaneous events, as in (20), which may be coerced to a repetition reading when they occur with an atelic frame adverbial. Following Smith (1991), I shall call the latter 'semelfactives'.
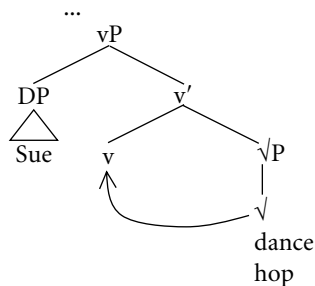
(19)   Activities

    a. Sue danced   for five minutes/#in five minutes.

    b. Sue whistled   for five minutes/#in five minutes.

    c. Sue slept   for five minutes/#in five minutes.

(20)   Semelfactives

    a. Sue hopped   #for five minutes/#in five minutes.

    b. Sue tripped   #for five minutes/#in five minutes.

    c. The light flashed   #for five minutes/#in five minutes.

Hale and Keyser's (H&K's) proposed structure for such verbs is represented in (21) below:

(21) L-syntax for unergative verbs of activity

'Sue danced/hopped.'

Again, H&K intended these to have semantic properties similar to those of their paraphrases, such as *do a dance* and *do a hop*, and again, in (22) below, we see that the same Aktionsart properties hold of the unergative and its transitive paraphrase:

(22)   a. Sue danced   for five minutes/#in five minutes.
         b. Sue did a dance   for five minutes/in five minutes.
         c. Sue hopped   #for five minutes/#in five minutes.
         d. Sue did a hop   #for five minutes/#in five 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 n. 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*: *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 fundamentally are either point-like (instantaneous) or extend for an arbitrarily long time (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 point-like Event Root occurs in direct object position, the measuring-out effect—the event–object homomorphism—therefore produces a point-like meaning for the vP containing it. The typology of Roots we have considered so far, then, is seen in (23):

(23)

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.

3.3.2 *Transitive atelic and semelfactive verbs*

Recall one of our classes of problem verbs from section 3.2 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 (1992a)'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.
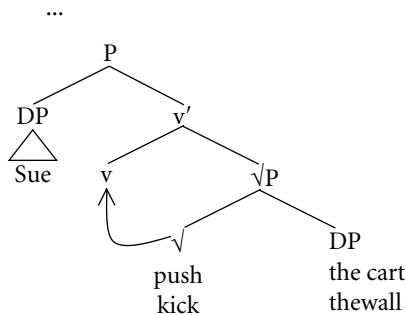
(24)   a. John pushed the cart   for five minutes/#in five minutes.

        b. Sue drove the car   for five minutes/#in five minutes.

   c. Sue kicked the wall   #for five minutes/#in five minutes.

   d. A bird pecked Sue   #for five minutes/#in five 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.

H&K'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 (19) and (20) 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 (25) below:

(25)

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                      ...
                       P
              ┌────────┴────────┐
             DP                 v'
              △           ┌─────┴──────┐
            Sue           v           √P
                          ↑      ┌─────┴─────┐
                          │      √          DP
                          └──── push      the cart
                               kick       thewall
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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 produces event–object homomorphism 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,[4] for some as yet mysterious reason, while Event-naming Roots can do so. Our inventory of basic Root properties now looks like (26).

(26)

	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.

3.3.3   *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 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 de-adjectival, illustrated in (27) below:

(27)   Deadjectival change-of-state verbs

   a. Sue cleared the table   #for five minutes/in five minutes.

   b. The archeologist opened the
        sarcophagus   #for five minutes/in five minutes.

   c. Sue tamed the lion   #for five minutes/in five 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 statepredicated of the object. Some undergo

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   [4] H & K actually propose a more complicated representation than this, where the predication of the small clause is not direct, but is mediated by a lower V head, rather like Bowers' (1993) or Baker's (2003) PredP. See e.g. Hale and Keyser (this volume) for more discussion.

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 (28).

(28)
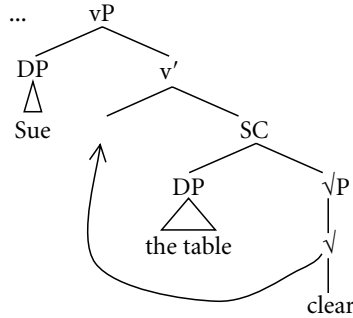
'Sue the table.'

Here, the surface object DP is in what H&K call the 'inner subject' position.[5] 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. Here, then, we have a homomorphism between the Event and the degree of satisfaction of a State, rather than the Incremental-Theme style Event–Object homomorphism. 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.[6]

There do seem to be complement-taking State-denoting roots: contrast the de-adjectival change-of-state verbs and their resultative paraphrases in (29) and (30).

(29)   a. Jill cleared the table (of dishes).

       b. Jill swept the table clear (of dishes).

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[5] For an alternative treatment of this decomposition within a H&K-style analysis, see Erteschik-Shir and Rapoport, this volume.

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

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

      c. Jill emptied the box (of marbles).

      d. Jill made the box empty (of marbles).

(30)   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 (29) seem happy to take a complement, while those in (30) 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 predicates (31), although both closed-scale and open-scale adjectival predicates can form change-of-state de-adjectival verbs (32):

(31)   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)

(32)   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. De-adjectival verbs based on [−bounded] State Roots, then, should be at least potentially atelic, and indeed, that has been claimed in the literature (Hay et al. 1999), based on examples like those in (33) (note the paraphrases).

(33)   a. Bill lengthened the rope for five minutes.

      b. (Bill made the rope longer for five minutes.)

      c. The storm lessened for five minutes.

      d. (The storm became less for five minutes.)

If that is so, then we have the possible Root meanings shown in (34).

(34)

	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 de-adjectival 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 (35);

(35)   a. Jill flattened the piece of tinfoil   in five minutes/#for five minutes.

  b. Jill flattened tinfoil   #in five minutes/for five minutes.

  c. Jill cleaned the dish   in five minutes/#for five minutes.

  d. Jill cleaned dishes   #in five minutes/for five minutes.

In this case, however, unlike the case of 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 de-adjectival 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 the subject of the SC is 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 H&K that we have not yet considered, however: the location/locatum verbs. We turn to these in the next section.

3.4 Denominal location/locatum verbs

Besides the denominal unergative verbs discussed in section 3.3.1 above, Hale and Keyser (1997) propose an l-syntactic structure with incorporation of a nominal root for a large class of transitive denominal verbs, location and locatum verbs. Some examples of each are given in (36) and (37); for more such verbs and important discussion, see Kiparksy (1997).

(36)   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.*

(37)   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.*

H&K propose that the same l-syntactic structure is the source of all such verbs. In essence, these are a sub-case of the SC de-adjectival 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 (38) and (39) below, illustrating in overt syntax the underlying structure they propose for verbs like *bag, corral, saddle,* and *paint*:

(38)   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.

(39)   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 (38) are locations and those in (39) are locatums (i.e. in (39) the object of the preposition is moving relative to the Inner Subject, while the reverse is true in (38)), the structure of the paraphrases, and the l-syntactic structures, that H&K propose for these verbs are identical. The structure is in (40).

(40)

```
           ...     vP
                  /  \
              DP      v′
              △      /  \
             Jill   v     SC
             Bill   ↑    /  \
                      DP     PP
                      △    /  \
                the horse  P   √P
                the wall          |
                                  √
                                  |
                               corral
                               paint
```

       'Jill corralled the horse.'
       'Bill painted the wall.'
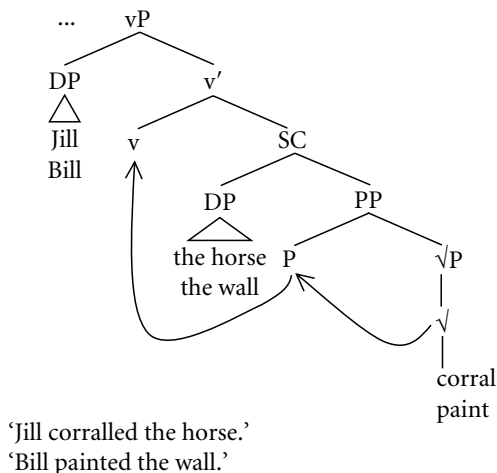
The abstract preposition, according to H&K, is a 'relational element' which establishes a meaningful link between the DP and the √P; they distinguish between a P of 'central coincidence' and a P of 'terminal coincidence', although it seems likely to me, following Mateu (2001), that the distinction is unnecessary in these instances.[7] One can identify a location or 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' overt syntax.

First, just as in the de-adjectival cases above, changing the number of the Inner Subject affects the measuring-out properties of the prepositional Small Clause (41), and, as we expect, changing the number of the direct object of the paraphrase has an identical effect (42)

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[7] Haugen (2004) and Siddiqi (2004) note that within a late-insertion framework like that of Distributed Morphology, this mechanism could naturally treated as a subcase of late insertion, conditioned by the underspecification mechanism operative in late insertion of phonological material in general. In Manner Incorporation cases, the semantic features of the v are compatible with the semantic features of several different roots. Manner incorporation, then, would simply be implemented as English allowing the late insertion of highly specified, 'lexical' roots to realize the semantic features of the v.

(41) a. John saddled the horse   #for five minutes/in five minutes.

   b. Sue boxed the computer   #for five minutes/in five minutes.

   c. Mom blindfolded a six-year-old #for a minute/in a minute.

   d. John saddled horses   for five minutes/#in five minutes.

   e. Sue boxed computers   for five minutes/#in five minutes.

   f. Mom blindfolded children   for five minutes/#in five minutes.

(42) a. Mom fit the six-year old with a blindfold   #for five minutes/in five minutes.

   b. Mom fit children with a blindfold   for three hours/#in three hours.

   c. Sue put the computer in a box   #for five minutes/in five minutes.

   d. Sue put computers in a box   for five minutes/#in five minutes.

This is the same phenomenon as in the de-adjectival 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 (43).

(43) a. Sue put the computer in boxes   for five minutes/#in five 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 (43) 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 (44) below, the location/locatum verb must be telic. When it is an unbounded Thing, however, as in (45) below, the verb may be atelic.

(44) a. John saddled the horse   #for five minutes.

   b. Sue boxed the computer   #for five minutes.

   c. Mom blindfolded a 6-year-old   #for a minute.

(45)   a. Susan watered the garden   for an hour.

       b. Bill greased the chain   for five minutes.

       c. Jill painted the wall   for an hour.

       d. Adelaide buttered the bread   for two minutes.

To recap: we attribute the introduced atelicity of the paraphrases in (43) 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 *saddle*. The same interpretive mechanism, applied to the same underlying structure, will account for the Aktionsart properties of both sets of sentences.

3.5 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 (46) below:

(46)   a. John hammered the metal   for five minutes/in five minutes.

       b. Sue brushed the dog   for five minutes/in five 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 (47).

(47)   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.[8] 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.

(48)
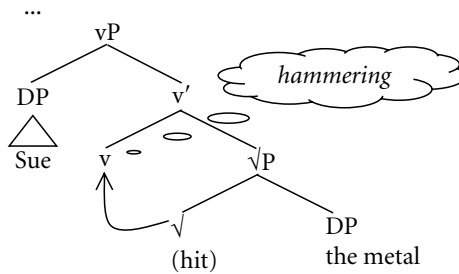
'Sue hammered the metal.'

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:

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[8] The same process is at work in Gleitman's (1990) 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).

(49)

a.   ...

b.

'Jill fit the horse with a saddle.'   'Bill smeared the wall with paint.'
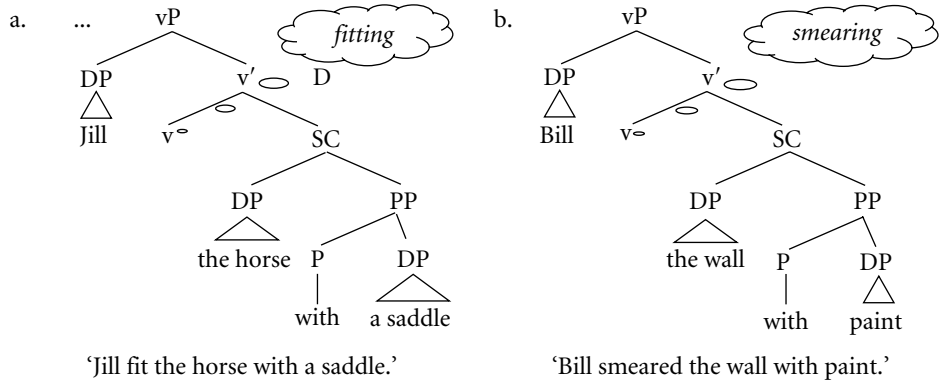
This notion that verbs in English can be named after the manner in which they are accomplished, assuming that encyclopedic considerations can be accommodated, has implications for the treatment of resultative constructions in English. For instance, when one adds a resultative PP to a verb like *push*, 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 (50), where DO and CAUSE are glosses of the approximate content of the v in the construction:

(50)   a. John pushed the cart.   John DO [$\sqrt{}_P$(a)$\sqrt{}$ push (of) the cart]

   b. John pushed the cart to New York.   John CAUSE [$_{sc}$ the cart to New York]

In (49b), there is no room for the $\sqrt{}push$ 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.[9] A good paraphrase would be something like [AQ1] *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 that it's in. 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 of 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 1985).

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 (51).

(51)

'Jill wrote the letter.'
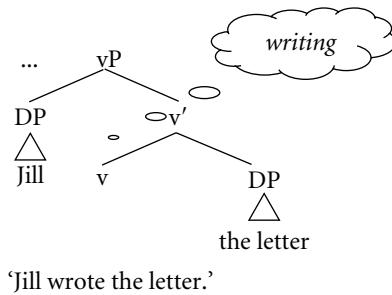
An interesting phenomenon, discussed at length by Kiparsky (1997), is that there seem to be idiomatic effects which restrict or enlarge the interpretation of l-syntaxes with conflation that are not in effect in the corresponding paraphrases with Manner Incorporation. For instance, in *Jill corralled the horse*, she can be understood simply to 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 do not 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* is generally 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 is the same little v in all cases: one that denotes the beginning of an event, and its initiator. It is just a weakness of English that 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.*

3.6 Concluding remarks

I have here 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 have 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 have 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.

Authour Query

AQ1   Footnote 9 is missing