522 Lecture 4 Feb 9, 1999

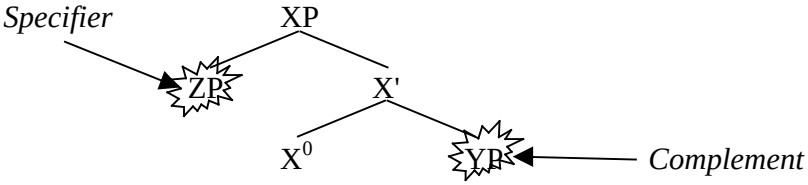
1 The Oracle of Hale and Keyser

Ok, so they're a little hard to understand. Trust me, there's an idea in there, or rather, several ideas, worth understanding.

1. The Explanandum
   (a) Verbs don't have very many arguments. Why not?
   (b) (an earlier version) The list of universal theta-roles is short (6-10, usually) and confused: it's difficult to decide what the appropriate theta-roles are, and what the relevant criteria are for naming/ascertaining individual instances of theta-role bearers. (Here's the connection to Dowty, and why we're talking about both of these in one week).

2. The Unmentioned Competing Theories:
   Theories like Jackendoff's, Pustejovsky's, and Levin's, have these complex lexical-semantic representations, and linking principles map the elements in these representations onto NP arguments and syntactic structures. In such theories, *there is no principled reason why a verb is allowed only 3 arguments*. Further, there are inexplicable gaps: Jackendoff, in particular, argues that the notion of PATH is highly conceptually relevant in conceptual structure. Despite this, however, NPs realizing PATH arguments are few and far between; it's far more usual for a PATH to be implied by the surrounding structure. (*John went to the store*: the PATH is the metaphorical line described between John's original location and the store; it doesn't show up syntactically).
   Any restriction on the number of arguments a verb may potentially take in these theoretical frameworks will have to be stipulated, or perhaps claimed to be derived from the syntax (Case? but PPs can serve as substantive arguments…)

3. The Answer to the Question in (1):
   There are so few arguments of verbs, cross-linguistically, because there's only three places an argument can come from: it can be projected as the complement or specifier of a basic lexical item, or it can be "added" to a verbal structure to satisfy the EPP, when there is no other legitimate argument available.



4.. *The Assumption about Verbalization:*

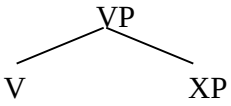
(a) For the purposes of understanding, let's ignore their discussion of the fundamentally acategorial nature of the "head" of the element of lexical argument structure. Let's, rather, adopt their basic cross-linguistic tendencies as hard-and-fast facts:

there are four, and only four, basic types of lexical items. These lexical items are what may be combined to make (monomorphemic) verbs:

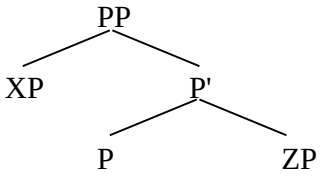
(i) Nouns take no arguments, and require no structure:

N

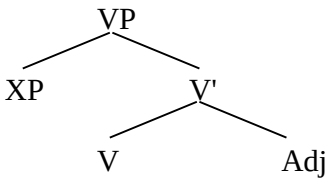
(ii) Verbs are predicational, and take one argument, a complement. They may project a specifier, but only "at the request of", to satisfy the predicational requirements of something else, i.e. an adjective. (see (iv) below)



(iii) Prepositions are *relational*, and take two arguments: one in their complement, and one in their specifier.



(iv) Adjectives are predicational, and take one argument. They require some help to project this argument, though: the argument must be projected/selected by something else (a verb), that they are then able to associate with, because there's a place in the argument structure for both them and their required argument:



(b) In order to surface as a verb, the head of the lexical argument structure (N, V, P or Adj) *must incorporate into something of category V*. If it's a V already, fine and dandy. If it's an N, P or Adj, it gets inserted as the complement of a V (recall that V's require a complement), and either *conflates* with (incorporates into) the V head and surfaces as the root of a verb, or is realized on the surface as the barefaced category that it actually is.

(c) If something of category V is "essentially" present, there's a further requirement. The full clause must have an appropriate DP subject. There are two potential sources of legitimate DP subjects:

(i) the *internal specifier* of the V head may raise to subject position (complements of V may not do this)

(ii) An *external argument* may be projected, for free, when nothing else is available to act as a subject. This argument will form a small clause with whatever material it adjoins to.

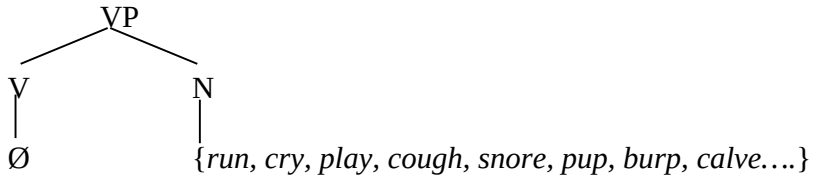
♦ Requirement (ci) enatils that *only adjectival roots* will produce lexical items (verbs) which take one of their own arguments as a subject — they're the only things that *have* an internal specifier of V.

♦ All other structures will get an *external argument*, by requirement (cii).

5. *Some examples of what this set of assumptions buys*:

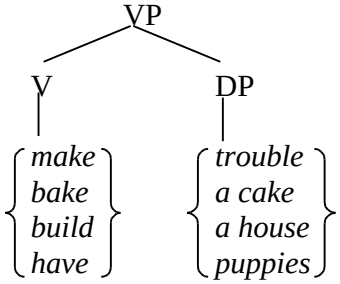
(a) Intranstive denominal verbs: <u>*unergatives*</u>

Nouns cannot project any arguments, nor are they of the appropriate category to appear as verbs by themselves. To make a verb from a noun, it must be embedded in the verbal structure (4aii above):



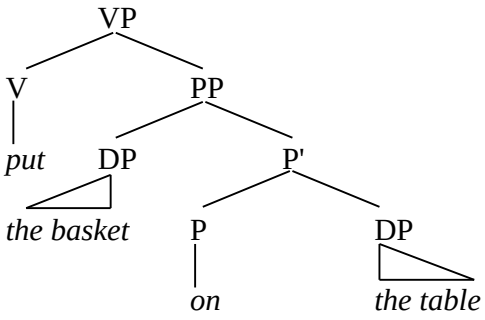
The noun *incorporates* into the verb (*conflates* with it), to produce the unergative verb. By restriction (4ci) above, and also because the conflation has happened, there is no appropriate XP to serve as a subject in this structure. Hence, an external argument is adjoined to the VP, and the whole thing is inserted into the appropriate clausal syntax (say, under an IP or a TP). The external argument raises to Spec-IP, gets Case, and everyone is happy.

(b) Transitive verbs: the basic verbal situation — *verbs of creation*



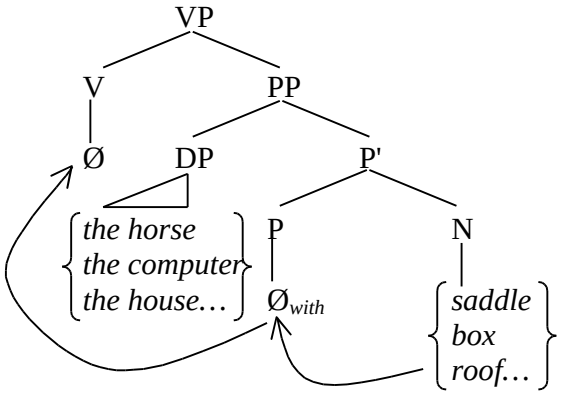
Here, the verb satisfies its requirement that it have a complement with the DP indicated; H&K note that of course some of these verbs also allow the complement requirement to be satisfied with an IP or a CP ("make Sue go to the store" etc.) The DP argument, however, because it is a complement, may not raise to satisfy the EPP (restriction (4ci)) and hence an external argument is projected and ajoined to VP.

(c) *Put* and location/locatum verbs: *verbs of location change*



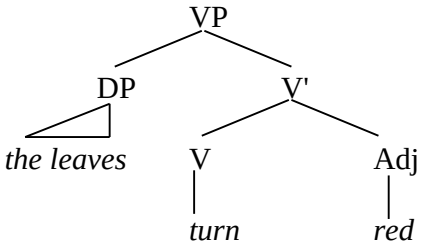
Here, the PP frame is projected, with both the specifier and the complement, making a thematically complete predicative structure. It's of the wrong type, however, to occur as a verb on its own. So, in order to show up in a verbal frame, the whole thing (like the N in (a) above) is realized as the complement to a verbal head, in this case, *put*. BUT, now, there's nothing that can raise to be the subject of the sentence! The internal specifier of PP is now embedded as part of the complement to V, and is hence "trapped" down inside the lexical argument structure. Hence, again by requirement (4cii), an external argument is projected and adjoined.

The same structure may be realized with a bare N head in the complement spot. In this case, conflation is possible (in fact, required: the empty heads need phonological support), producing the location/locatum verbs:



Again, because there is no legitimate potential subject DP, an external argument must be projected and adjoined, creating a transitive verb: *J. saddled the horse, boxed the computer, roofed the house…*

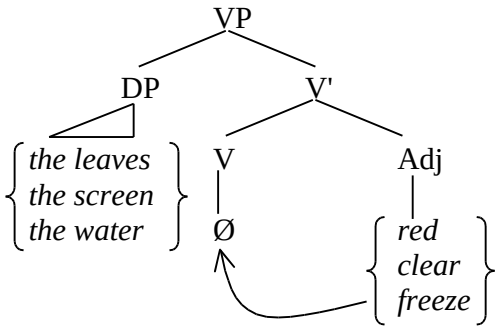
(d) *Adjectival resultatives and inchoatives*



Finally, the last and probably most confusing case. The Adjective category, like the noun category, can't project any arguments. However, it selects for one: it's fundamentally predicational, like the verb. In order to be licensed in a given context, it must be provided with an argument that it can predicate itself of. In the verbal context, it's inserted as sister to (complement of) a verbal head. That verbal head then obligingly projects a specifier, which is filled with the argument DP that the adjective requires to satisfy its predication needs.

Now, this verbal head is a *verb*, so it is ok as far as the requirements of the verbal context go. Hence, this structure can be inserted as is into the extended projection of the verb (IP, say). And the DP in the internal specifier may happily raise up to be the subject of the clause. This gives the standard unaaccusative structure: *The leaves turn red*.

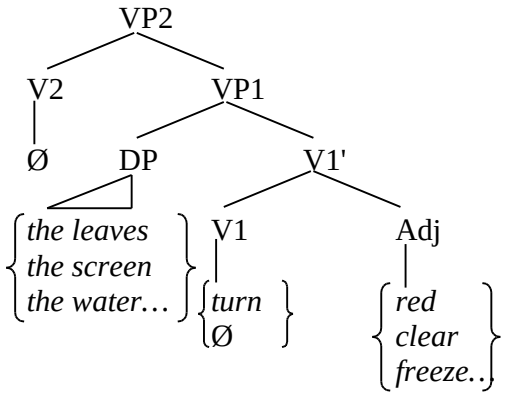
In the same manner as the PP case above, however, the V which the adjective head is inserted into may be null. This then results in conflation:



and the standard deadjectival (mostly) inchoative unaccusatives: *the leaves reddened, the screen cleared, the water froze.*

(e) *Adding an external argument to inchoatives:*

Recall that the null verb we've been adding to most of these items to get them properly inserted into the verbal context *doesn't care* what its complement is, as long as the head of that complement is of an appropriate type that can conflate with it and give it its needed phonological support. (Lexical X^0s work, D^0s and IP^0s, e.g., don't). In this case, as well, we can (although we don't *need* to), insert the adjectival structure above into the complement position of a null V. We can do this whether the adjectival structure is headed by an overt V (e.g. *turn*) or by a null V with an Adj in it (*redden*):



Now, in this case, nothing is available to satisfy the EPP: the internal specifier of VP1 is disbarred because it's in the complement position of the higher V2 (just like the internal specifiers of the PPs, above), and hence an external argument must be projected and adjoined to the whole clause, producing the transitive versions: *The cold turned the leaves red, the ESC button cleared the screen, the fridge froze the water*.

6. Some questions:

(a) Why can't you put the basic verbal structure ("build house") in the complement position of this null V, and transitivize it?

Answer: because there'd be nowhere for the extra argument to come from. Consider putting "make trouble" in the complement position of the null V, and raising the verb "make" to it. In the *normal* realization of "make trouble", the external argument is projected as a freebie, and adjoined to VP. But here, you can't include that external argument, because it's an adjunct: not part of the lexical structure — and by putting the VP1 *make trouble* in the complement position of V2, you've required that it contain only lexical structure, no additions (otherwise we'll run into the conflation problem mentioned above). So you can add an external argument to the top VP, VP2, but you'll still only have a transitive structure, not a transitivized one. (There's also probably a case-marking problem: in all the cases we've seen, when an extra V is added to something, it either has something to case-mark (its complement or the internal specifier of its complement) or else N incorporation takes place, which arguably absorbs the case of the added V. In this case, with no internal specifier and no N or DP complement, the upper V has case to assign but no one to assign it to, perhaps resulting in a crashed derivation. This may be the real reason why you can't say "John built the house" and mean, "John caused (someone) to build the house").

(b) What's all that stuff about "basic" intransitives and "basic" transitives?

Evidence from some verb classes in a couple of languages demonstrates that some things that might look unaccusative/inchoative in English, e.g., actually look like transitives that have been syntactically detransitivized (e.g. with a reflexive morpheme) in other languages. Because languages will choose to lexicalize their verbs in different ways, some variation in what's a conflating-type PP verb (i.e. transitive) and what's a conflating-type Adj verb (i.e. unaccusative) is expected.

7. Some problems:

(a) Why is it that in all these cases, the free, adjoined external argument, supposedly simply "composed" with the VP, seems to act as a Causer or Agent, initating the event denoted by the VP? Perhaps they ultimately want it to bear other roles, e.g. in stative sentences — but we don't have a concrete proposal for such cases yet. So far, it's an Agent. Is that a linking rule? A default interpretation?

(b) If the various properties of the heads are semantically, not categorially, determined, the learnability problem (especially if there can be zero-derived syntactic detransitivizations, in Berber), is huge. Handwaving at syntactic category doesn't solve the problem: unless the kid knows "adjective" to start with, he won't be able to decide if a given construction is prepositional or adjectival — but H&K maintain that there is a robust class of languages that lack "adjective" qua syntactic category. What do kids learning those languages do?

(c) Separating the inchoative/causative alternating unaccusatives from the nonalternating ones (*appear, arise,* etc.) makes sense in one way: they have different properties in that one alternates and one doesn't. But in other significant ways, which H&K gesture at, they are similar. In particular, the two classes share the semantic feature most often associated with unaccusativity: *telicity*. Telicity is usually associated with a measuring-out argument (see Dowty, below).

2 Dowty: weighted argument structure linking

(1) 2 claims:

(a) The grammatical positions/relations that have linking rules associated with them are SUBJECT, OBJECT and OBLIQUE (relative to some langauge, c.f. discussion of ergantivity).

(b) Deciding on a semantic basis which argument goes in which position involves counting the number of PROTO-AGENT and PROTO-PATIENT characteristics each argument has, and linking the one with the most of the first sto SUBJECT and the one with the most of the second to OBJECT.

(2) The explanandum: Once you try to really sit down and identify theta-roles, you immediately run into problems:

Old standards: Agent, Patient, Goal, Source, Theme, Experiencer, Instrumental..

Blake (1930) offered 87 temporal and locative roles and 26 others, including Additional (*he gave him a sum of money BESIDES THE CATTLE),* Substitutive (*INSTEAD OF THE CATTLE*), and Similative (*he barked LIKE A DOG*).

Figure, Ground, Neutral, Subject, Recipient,

Just for "Agent": Agent vs. Actor, Volitive, Effective, Initiative, Agentive…

(3) Two possible tacks:

(a) Forget about the linking-principle side of theta-roles. Rather, assume each verb assigns a set of theta-roles specific to it (*love*: *lover, lovee*, *hit: hitter, hittee*…) and maintain the Theta-Criterion etc. as indexing tools.

(b) Forget about the argument-indexing properties of theta-roles, and try to figure out the meaning correlates associated with particular syntactic frames and alternations; appeal to the semantic content of theta-roles as explanations for these correlations.

(4) There's an independent reason to think that the Theta-Criterion is both too powerful and too weak a principle to serve as an argument indexer. Consider Heim and Kratzer's discussion (in *Semantics and Generative Grammar*). of a verb's *inherent valence*: if a verb with valence 3 ends up in a structure with only 2 arguments, the result will be uninterpretable on purely composiitonal grounds — no need to appeal to a violation of the Theta-Criterion to explain the badness of **John hit.*

(5) Some assertions:

(a)We should only consider "event-dependent" notions when constructing theories of thematic roles (and, even abstracting away from this specific proposal, any theories of linking). Especially, perspective-dependent considerations such as "Figure" and "Ground" should be eliminated from our box of basics.

(b) We should consider those notions that are demonstrably relevant to argument selection (somewhere in some language).

(c) One such notion is "Incremental Theme", where an argument measures-out the event through a series of homomorphic part-whole relationships.

(6) An argument for (5a):

(i) In an adequate linguistic description, grater relative degrees of connectedness to previous discourse, givenness, etc., must be explicitly specified as a semantic correlate of grammatical subject denotations

(ii) All putative instances of perspective-dependent thematic roles and other 'perspective-indicating' lexical entailments of words can be shown to be instances of (i) when properly analysed.

(iii) Therefore, perspective-dependent thematic roles are superfluous and unnecessary, and all roles are event-dependent in meaning.

(7) *What happenend to the tree?*

a. ??The truck hit the tree.
b. The truck hit it.
c. The tree was hit by the truck (perhaps ? due to lack of anaphor).
d. It was hit by the truck

What happened to the truck?

e. The truck hit the tree. (perhaps ? due to lack of anaphor).
f. It hit the tree.
g. ??The tree was hit by the truck.
h. ??The tree was hit by it.

If the "lexical subject" of "hit" were bearing some sort of "Figure" role here, then (h) ought to be natural. The fact that it isn't demonstrates that it's the notion of syntactic subject that is linked to the perspective-implicating role "Figure" (cf. the naturalness of 4d).

(8) Incremental Theme Subjects:

(a) John entered the icy water very slowly.

(b) The crowd exited the auditorium in 21 minutes.

(c) Moving slowly but inexorably, the iceberg took several minutes to pierce the ship's hull to this depth.

(9) fn. 15: "Some will suggest that the subjects of the unaccusatives are derived by Unaccusative Advancement froom underlying direct objects, hence that at that level they conform to the claim that all Incremental Themes are direct objects. This is less plausible for "John entered the water gradually", which has a visible, independent direct object. Even here, of course, one can imagine a suggestion that *the water* originates as an underlying oblique and is advanced to direct object after *John* is advanced from direct object to subject. At that point, of course, one would have a right to ask whether the invariant association of Incremental Theme with syntactic direct object still had any empirical content or had been elevated from empirical hypothesis to methodological assumption, i.e. that one was in actuality prepared to postulate any syntactic abstractness necessary to maintain a uniform semantic association with a certain syntactic position…."

(10) The Actual Proposal

(a) PROTO-AGENTS

i. volitional involvement in the event or state
ii. sentience and/or perception
iii. causing an event or change of state in another participant
iv. movement relative to the position of another participant
(v. exists independently of the event named by the verb).

(b) PROTO-PATIENTS

i. undergoes change of state
ii. incremental theme
iii. causally affected by another participant
iv. stationary relative to movement of another participant
(v. does not exist independently of the event, or not at all).

(11) (a) ARGUMENT SELECTION PRINCIPLE: In predicates with grammatical subject and object, the argument for which the predicate entails the greatest number of Proto-Agent properties will be lexicalized as the subject of the predicate; the argument having the greatest number of Proto-Patient entailments will be lexicalized as the direct object.

(b) COROLLARY 1: If two arguments of a relation have (approximately [!!! -ed]) equal numbers of entailed PROTO-AGENT and PROTO-PATIENT properties, then either or both may be lexicalized as the subject (and similarly for objects).

(c) COROLLARY 2: With a three-place predicate, the nonsubject having the greater number of entailed Proto-Patient properties will be lexicalized as the direct object and the nonsubject argument having fewer entailed Proto-Patient properties will be lexicalized as an oblique or prepositional object (and if two nonsubject arguments have approximately

equal numbers of entailed P-Patient properties, either or both may be lexicalized as direct object).

(d) NONDISCRETENESS: Proto-roles, obviously, do not classify arguments exhaustively (some arguments have neither role) or uniquely (some may share the same role) or discretely (some arguments could qualify partially or equally for both proto-roles).

(12) This is based on the notion of semantic *entailment*: "A set of entailments of a group of predicates with respect to one of the arguments of each". This allows us to group verbs into classes, where, say, class 1 involves entailment of property (10ai and 10aii) for its subjects, but none of the others (10aiii-iv).

(13) Examples of how the system works to predict alternations (NOTE: Dowty is assuming a *monostratal* syntax; for him, all argument-structure alternations must be controlled from the lexicon, by lexical rules. This is of particular interest in his discussion of the Unaccusative Hypothesis, since he can't appeal to movement as an explanation of the properties of unaccusative verbs):

(a) *buy/sell*: both merchant and customer must be volitional in an event of this type; they aren't distinguished by any relevant argument selectional properties, above. Hence there are two different lexicalizations of this event, one with one argument as subject, one with the other.

(b) Psych predicates: *like/please, fear/frighten, suppose/seems to, regard/strike as*…: The "stimulus" argument and the "experiencer" argument each have some Agenty properties (causation in the first instance, sentience in the second). As they're tied, again, alternate lexicalizations of the events are possible.

(a) "partially symmetric interactive predicates"

i. The drunk embraced the lamppost
ii. #The lamppost and the drunk embraced.
iii. The truck collided with the lamppost
iv. The truck and the lamppost collided (both moving)

(b) spray/load alternations

i. Mary loaded hay onto the truck
ii. Mary loaded the truck with hay

Either "hay" or "truck" can be incremental themes, and hence are tied as Proto-Patients.

(c) hit/whack alternations, vs. no such break alternations:

i. John hit the fence with the stick
ii. John hit the stick against the fence.
iii. John broke the fence with the stick.
iv. *John broke the stick against the fence (on a reading equal to iii.)

In *hit* verbs, both Instrument and Patient are tied for Proto-Patient possibilities (see problem (f) below, though), while with *break* verbs, the Patient undergoes a change of state, forcing it to map to direct object in preference to the Instrument.

Note: he argues that a superficially similar seeming class of non-alternators (*smash, wallop, club, flog…)* that require the Patient-Object frame and ones that require the Instrument-Object frame (*dash, throw, lob, loft, bounce…*) each entail a change-of-state in the Patient or Instrument, respectively, unlike the *hit* class above, and hence don't alternate (like the *break* classs).

(14) Problems

(a) *chase/flees*

(b) What's the difference between "alternative lexicalizations" and "different meanings for the *same* verb that are recorded as independent items in the lexicon, perhaps connected by lexical rules"? I.e., why aren't *buy* and *sell* the same verb, like *spray* in each of its frames?

(c) Object-experiencer verbs (w/ "stimulus" subject) are all *eventive*:

i. What happened to Mary was that the birthday party surprised her.

ii. *What happened to Mary was that she liked the birthday party.

These are perhaps not a problem, given that the Experiencer argument in (i) but not (ii) is undergoing a change of state. But see (d) below:

(d) "Nonstandard lexicalizations": *receive, inherit, come into, undergo, sustain, suffer from, submit to, succumb to,* and *tolerate, get-passives*. "sentience might in some cases be a sufficient entailment to license an argument's lexicalization as subject, no matter how many P-patient entailments it has" or "historical semantic drift can result in a predicate that violates selection principles." The former might take care of the caused-motion cases mentioned below, but it wreaks havoc on the eventive psych-verb generalization

(e) In the *spray/load* verbs, while either argument can be the Incremental Theme and undergo a change of state, *only one argument moves: the other is always* "stationary relative to movement of another participant", a Proto-Patient property. Hence, "the truck" ought to be the preferred object. Here we see why he hedges ("approximately equal") above! In fact, cross-linguistically, as we saw last time, it's the "ground-object" frame that is rarer, when Dowty predicts the opposite. We can see a reflex of this property in (i) and (ii) below:

i. Paint sprayed the wall.

ii. *The wall sprayed with paint.

Why is it relevant for subjecthood/objecthood here, but not for direct vs oblique below?

(Also, his answer to the "why don't *fill/cover* verbs alternate" is pretty much unsatisfactory: "One might speculate that the existence of the morphologically related adjective *full* and noun *cover*, both entailing complete occupancy/coverage of the space in question, help maintain the restriction of these verb meanings to a locative Incremental Theme, and have prevented the child's temporary innovation from surviving into the adult language, over the many centuries these forms have existed in English".) He doesn't even discuss the nonalternating figure-object verbs: *pour*, etc.

(f) Same problem as for *spray/load* above: in any "hitting" or "breaking" scenario, the Instrument always moves, and the Patient is always "stationary relative to movement of another participant"; hence, if all the criteria are weighted equally, the Patient should always be the object, in the *hit* cases as well as the *break cases.*

An observation: when the Instrument is a body part, in the Instrument-Object frame, one gets an "accidental" implication, although not in the Patient-Object frame:

i. John hit his hand against the fence. (seems like an accident)
ii. John hit the fence with his hand.
iii. John hit his head on/against the post. (accident)
iv. John hit the post with his head (not so much an accident?)

(g) Dowty gives i. below as an example of a movement-related PROTO-AGENT property, hence explaining the association of the moving thing with subject position:

i. The bullet overtook the arrow
ii. Water filled the boat.

Presumably he would wish to ascribe the subjecthood of the moving thing in (iii) and (iv) to this constraint as well:

iii. The ball rolled down the hill.
iv. The remote-control car raced around the track

However, compare (v) and (vi)

v. John rolled the ball down the hill.
vi. Sue raced the remote-control car around the track.

Here, causation is the only Proto-Agent property of the subject (not sentience: compare *the wind rolled the ball down the hill*), while the object has another Proto-Agent property. Why aren't they tied? (Perhaps in these cases the subject moves relative to the position of another participant? What then about (vi)?)

(h) Unaccusativity as a semantic, rather than syntactic, phenomenon. (Syntactic correlates of unaccusativity, including *ne*-cliticization, auxiliary selection, lack of *himself*+resultative construction, etc. etc., do not reflect a derivational fact, but are correlates of the semantic cluster of unnacusative properties mapping to the syntax (special linking principles for unaccusatives).