

Severing the External Argument from the Verb

1 Issues of logical form and Logical Form

What is the right characterization of the logical form (= conceptual structure) of (1)?

- (1) Kim bought the slippers in Marrakesh.
- a. $\lambda e.\mathbf{bought}(\mathbf{slippers})(\mathbf{Kim})(e) \wedge \mathbf{in}(\mathbf{mksh})(e)$ DAVIDSONIAN
 - b. $\lambda e.\mathbf{bought}(\mathbf{slippers})(e) \wedge \mathbf{agent}(\mathbf{Kim})(e) \wedge \mathbf{in}(\mathbf{mksh})(e)$ NEO-DAVIDSONIAN
 - c. $\lambda e.\mathbf{bought}(e) \wedge \mathbf{theme}(\mathbf{slippers})(e) \wedge \mathbf{agent}(\mathbf{Kim})(e) \wedge \mathbf{in}(\mathbf{mksh})(e)$ “

What is the right characterization of its Logical Form: syntax, verb meaning and composition?

- (2) $[[\mathbf{buy}]] =$
- a. (i) $\lambda x \lambda y \lambda e.\mathbf{bought}(x)(y)(e)$
(ii) $\lambda x \lambda y \lambda e.\mathbf{bought}(x)(e) \wedge \mathbf{agent}(y)(e)$
(iii) $\lambda x \lambda y \lambda e.\mathbf{bought}(e) \wedge \mathbf{theme}(x)(e) \wedge \mathbf{agent}(y)(e)$
 - b. (i) $\lambda x \lambda e.\mathbf{bought}(x)(e)$
(ii) $\lambda x \lambda e.\mathbf{bought}(e) \wedge \mathbf{theme}(x)(e)$
 - c. $\lambda e.\mathbf{bought}(e)$

What kinds of data/arguments bear on these questions? And if thematic arguments are not part of the meaning of the verb, then where do they come from? Today we're going to focus on the external argument; next week we'll look in more detail at internal arguments.

2 Severing the external argument from the verb

2.1 Object-dependent verb (phrase) denotations

There are many instances where a particular kind of internal argument triggers a particular interpretation of a verb:

- (3)
- a. throw a baseball
 - b. throw support behind a candidate
 - c. throw a boxing match
 - d. throw a party
 - e. throw a fit
- (4)
- a. take a book from the shelf
 - b. take a bus to White River Junction
 - c. take a nap
 - d. take an aspirin
 - e. take dictation
- (5)
- a. kill a cockroach
 - b. kill a conversation
 - c. kill an evening watching TV
 - d. kill a bottle
 - e. kill an audience

There are very few parallel examples involving external arguments.

- Marantz (and Kratzer): This is evidence that only internal arguments are encoded in verb meaning (lexical representation).
- Bresnan and Grimshaw: This follows from the more general fact that external arguments are the last to enter composition.

How might we explain these facts? The first option is to assume that each instance of e.g. *kill* in (5) is really a separate verb, possibly related through some kind of lexical network, but each with its own special selectional restrictions that guarantee that the object forces the right interpretation:

- (6)
- $\llbracket kill_{base} \rrbracket = \lambda x : \mathbf{alive}(x)\lambda y\lambda e\dots$
 - $\llbracket kill_{talk} \rrbracket = \lambda x : \mathbf{interaction}(x)\lambda y\lambda e\dots$
 - $\llbracket kill_{time} \rrbracket = \lambda x : \mathbf{temp-interval}(x)\lambda y\lambda e\dots$

But this kind of approach is in principle applicable to any argument of the verb (independent of whether we treat verb denotations as Schönfinkelized/Curried functions a la Heim and Kratzer).

What if instead we treat the verbs as complex functions:

- (7)
- $$\llbracket kill \rrbracket = [\lambda x.$$
- if $\mathbf{alive}(x)$, then $\lambda y\lambda e\dots$
 - else if $\mathbf{talk}(x)$, then $\lambda y\lambda e\dots$
 - else if $\mathbf{temp-interval}(x)$, then $\lambda y\lambda e\dots$
- $$]$$

But this suffers from the same problem as the first approach: there is no (non-stipulative) way to restrict this sort of argument-dependent specification of the output to just certain arguments.

- The only way to prevent one of these approaches from applying to external arguments is to remove it from the computation of the verb meaning entirely!

2.2 Nominalizations

Earlier we looked at nominalizations like (8a) and (8b), which are sometimes called *of_{ing}* and *pos_{ing}* nominalizations, respectively. (8c) represents a third type: *acc_{ing}* nominalizations.

- (8)
- We enjoyed his reading of *Pride and Prejudice*
 - We enjoyed his reading *Pride and Prejudice*.
 - We enjoyed him reading *Pride and Prejudice*.

Consider a situation in which the individual referred to by *his/him* does not actually do any reading at all, but is instead one of several people charged with organizing readings of *P&P*. Assume that the particular reading organized by this individual was enjoyable to us. (8a) can be used to describe this situation; (8b-c) cannot. This shows that *his* in (8a) is not semantically an agent, but rather a true ‘possessor’; i.e., that the interpretation of *his* in this example is parallel to the interpretation of *his* in (9a-c).

- (9)
- Max presented his article.
 - Max sold his car.
 - Max brought his grandfather to the table.

But this in turn means that there is a way to nominalize a verb without its external argument, which suggests that there is a place in the representation at which the agent has not yet been introduced.

2.3 Self-action (or lack thereof)

Next[a] has a reflexive interpretation; (10b) does not.

- (10) a. The children have combed themselves.
b. They have combed the children.

This is usually explained in lexico-syntactic terms: roughly, a verb can be understood as denoting a reflexive relation only if it is reflexive-marked.

Now consider the following contrast from German:

- (11) a. die schön gekämmten Kinder
the nicely combed children
(compatible with self-action)
b. die gestern gekämmten Kinder
the yesterday combed children
(incompatible with self-action)

Of relevance here is that manner adverbs are lower than temporal adverbs:

- (12) a. Ich hab' dich gestern schön gekämmt.
I have you yesterday nicely combed
'I combed you nicely yesterday.'
b. *Ich hab' dich schön gestern gekämmt.
I have you nicely yesterday combed

- (13) a. Schön gekämmt hat er dich nicht.
nicely combed has he you not
'He didn't comb you nicely.'
b. Gestern gekämmt hat er dich nicht.
yesterday combed has he you not
'He didn't comb you yesterday.'

2.4 Schein's argument

The following sentences have 'cumulative' interpretations of the cardinal subject relative to the rest of the sentence.

- (14) a. Three copy editors caught every mistake in the ms.
b. *Between the three copy editors, all the mistakes were caught, though none of the three needs to have caught them all.*
- (15) a. Three video games taught every quarterback two new plays.
b. *Three videos provided the inspiration for every quarterback to learn two possibly different new plays, though none of the three needs to have influenced every QB.*

Truth conditions that don't work:

- (16) a. $\exists x[\mathbf{3ed}(x) \wedge \forall y[\mathbf{mis}(y) \rightarrow \exists e[\mathbf{catch}(x)(y)(e)]]]$
Same plurality for every mistake!
b. $\exists x[\mathbf{3ed}(x) \wedge \forall y[\mathbf{mis}(y) \rightarrow \exists e\exists z[z \preceq x \wedge \mathbf{catch}(z)(y)(e)]]]$
Allows for one editor to do everything!

We need to be able to pull the agent out:

- (17) a. $\exists e \exists x [\mathbf{3ed}(x) \wedge \mathbf{ag}(x)(e) \wedge \forall y [\mathbf{mis}(y) \rightarrow \exists e' [e' \preceq e \wedge \mathbf{catch}(y)(e')]]]$
Close, but still allows two of the editors to be doing something else!
 b. $\exists e \exists x [\mathbf{3ed}(x) \wedge \mathbf{ag}(x)(e) \wedge \forall y [\mathbf{mis}(y) \rightarrow \exists e' [e' \preceq e \wedge \mathbf{catch}(y)(e')]]] \wedge \exists y [\mathbf{mis}(y) \wedge \mathbf{catch}(y)(e)]]$
Ensures that all of the editors were part of a minimal mistake-catching event.

Interestingly, it's not clear that we can get the same effect if the universal quantifier is the external argument and the cardinality predicate is the theme, regardless of its syntactic position:

- (18) a. Every copy editor caught 500 mistakes in the ms.
 b. 500 mistakes in the ms. were caught by every copy editor.
 c. 500 mistakes were caught through the efforts of all of the copy editors, though none of them caught 500 mistakes on his own.

For comparison, (19a) clearly has the relevant reading, as does (19b) and I think (19c); I'm not so sure about (19d).

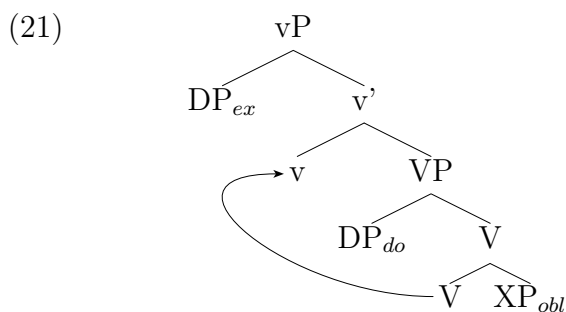
- (19) a. The copy editors caught 500 mistakes in the ms.
 b. Seven copy editors caught 500 mistakes in the ms.
 c. All the copy editors caught 500 mistakes in the ms.
 d. Every copy editor working together caught 500 mistakes in the ms.

3 The syntax and semantics of voice

3.1 Syntax

So if the external argument doesn't come from the verb (is not part of verb meaning), where does it come from? Kratzer's answer: from a VOICE head, which we now know and love as *v*.

- (20) a. Mokilese transitivity morphology
 b. Yaqui (in)transitivity morphology



This geometry predicts contrasts like the following.

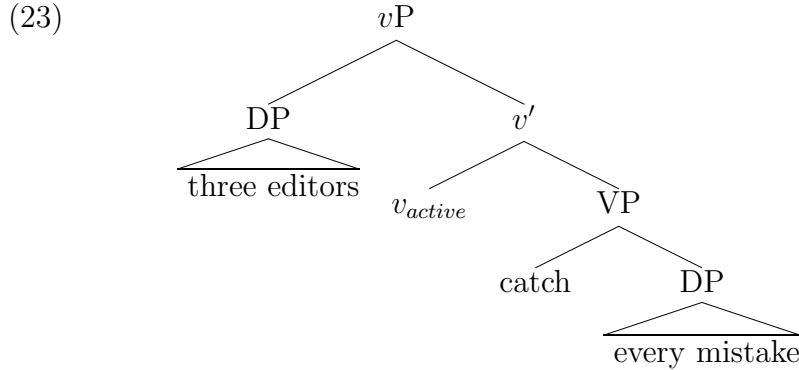
- (22) a. *Gary introduced to Sam Mittie.
 b. *Gary told to leave Sam.
 c. *Mikey visited quietly his parents.
 d. Chris walked quickly down the street.
 e. Mikey talked slowly to Gary.
 f. Gary tried dilligently to leave.

It also predicts the contrast between the German examples in (11), on the assumption that manner adverbials attach to VP and time adverbials attach to vP.

The nominalization data fall out as well, given the (by now standard) assumption that v (or at least v_{trans}) is the locus of ACC case: the fact that *of_{ing}* nominalizations have an *of* indicates that they do not (or at least need not) include vP, but are rather nominalizations of the verb or of VP. Assuming we get the semantics right, the fact that such nominalizations do not include v predicts that they need not entail agency.

3.2 Semantics

Let's work through the semantics by looking at the most complex example!



- (24)
- $\llbracket \text{catch} \rrbracket = \lambda x \lambda e. \mathbf{catch}(x)(e)$
 - $\llbracket \text{every mistake} \rrbracket = \lambda f_{\langle e, \langle \epsilon, t \rangle \rangle} \lambda e \forall y [\mathbf{mis}(y) \rightarrow \exists e' [e' \preceq e \wedge f(y)(e')]]$
 - $\llbracket v_{active} \rrbracket = \lambda x \lambda e. \mathbf{agent}(x)(e)$
 - $\llbracket \text{three editors} \rrbracket = \lambda f_{\langle e, \langle \epsilon, t \rangle \rangle} \lambda e \exists x [\mathbf{3ed}(x) \wedge f(x)(e)]$

(25) *Event Identification*

If α is a constituent consisting of daughters β, γ such that $\llbracket \beta \rrbracket$ is type $\langle e, \langle \epsilon, t \rangle \rangle$ and $\llbracket \gamma \rrbracket$ is type $\langle \epsilon, t \rangle$, then $\llbracket \alpha \rrbracket = \lambda x \lambda e. \llbracket \beta \rrbracket(x)(e) \wedge \llbracket \gamma \rrbracket(e)$.

We could do everything in terms of Functional Application if we modified the denotation of v_{trans} , though one potential argument for doing things this way is that we can have a very straightforward analysis of the semantics of passive *by*-phrases.

- A significant consequence of this analysis: *no type mismatch for VP-internal quantifiers!*

The semantic analysis accounts for the facts we examined in section 2. It also allows us to capture certain correlations between the main predicate and the subject, in particular those that involve aspect.

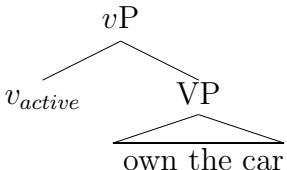
Assume first that basic distinctions in aspectual classification (aktionsart) involve selectional restrictions of verbs on their event arguments.

- (26)
- $\llbracket \text{own} \rrbracket = \lambda x \lambda e : \mathbf{state}(e). \mathbf{own}(x)(e)$
 - $\llbracket \text{walk} \rrbracket = \lambda e : \mathbf{process}(e). \mathbf{walk}(e)$
 - $\llbracket \text{build} \rrbracket = \lambda e : \mathbf{event}(e) \wedge \mathbf{protracted}(e). \mathbf{build}(x)(e)$
 - $\llbracket \text{notice} \rrbracket = \lambda x \lambda e : \mathbf{event}(e) \wedge \mathbf{happening}(e). \mathbf{notice}(x)(e)$

Assume also that there are multiple voice heads, with different shades of meaning and possibly different selectional restrictions.

- (27)
- $\llbracket v_{active} \rrbracket = \lambda x \lambda e : \mathbf{event}(e). \mathbf{agent}(x)(e)$
 - $\llbracket v_{state} \rrbracket = \lambda x \lambda e : \mathbf{state}(e). \mathbf{holder}(x)(e)$

This will result in various semantically anomalous combinations, such as (28).

- (28) a. 
- b. $\lambda x \lambda e : \mathbf{event}(e).\mathbf{agent}(x)(e) \wedge [\lambda e' : \mathbf{state}(e').\mathbf{own}(\mathbf{the\ car})(e')](e)$

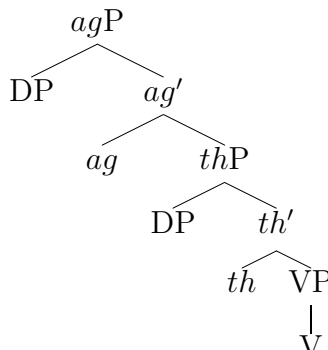
This gives us a handle on quite a few of the ‘tests’ for aspectual classification that we discussed last week, but there is a lot more to say about *why* we get the kinds of selectional restrictions we do.

A question: How does this view of things fit with the observation that aspectual classification is a property of VP meaning, rather than verb meaning?

4 Questions

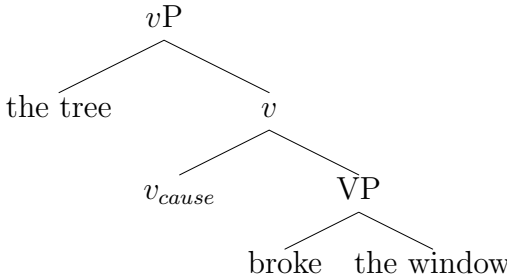
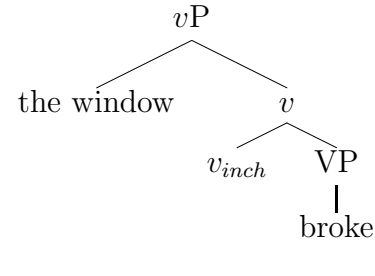
There seem to be compelling reasons to ‘sever’ the external argument from the verb. But this leaves open a number of significant questions.

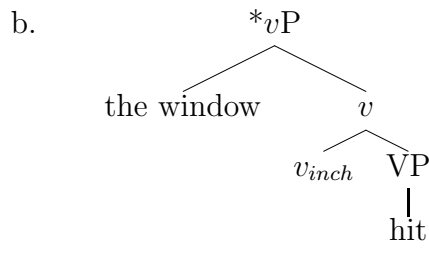
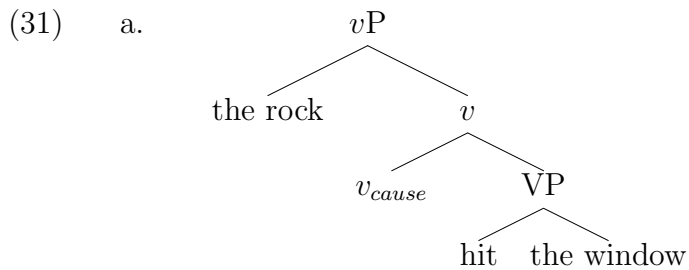
The first, though probably not the most significant, is whether there is reason to believe that all thematic arguments should be analyzed this way, i.e. if (2c) is the right way to think about verb meaning, and (29) (or something like it) is the right way to think about Logical Form.

- (29) 

A related question is whether languages can differ with respect to these issues. This seems likely.

The most pressing question, however, is how we can regulate the interaction of voice heads and verbs. E.g., why do we get the alternation in (30a-b), but no similar alternation in (31a-b)?

- (30) a. 
- b. 



The obvious initial answer is that this is a matter of selection: *hit* is not the type of verb that is selected by *v*_{inch} (and maybe not even by *v*_{cause} either), which is what rules out (31b).

OK, but what if we leave out *v* altogether, and derive **the window hit* by ‘normal’ principles of A-movement? Are we led to an extreme version of Neo-Davidsonianism as in (29) if we want to have a principled explanation of this? Regardless of whether we head down this route, we have to address the question of ‘how many voice heads?’, and whether their distribution is purely a matter of syntax (that would make things easier), or ultimately determined by features of meaning (that would seem preferable, to me at least).