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The adicities of thematic separation*

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Abstract This paper discusses whether or not verbs have thematic arguments or whether they just have an event variable. The paper discusses some evidence in favor of the Neo-Davidsonian position that verbs only have an event variable. Based on this evidence, the paper develops a transparent mapping hypothesis from syntax to logical form where each Spell-Out domain corresponds to a conjunct at logical form. The paper closes by discussing the nature of compositionality for a Conjunctivist semantics.

Keywords: adicities, composition, Spell-Out, thematic separation

1 Introduction

Most linguists learn at some point that verbs take arguments. There are transitive and intransitive verbs and the difference is roughly speaking whether verbs take two arguments or just one argument. This property has been taken to be theoretically significant and has played a rather important role in generative grammar as well as in other grammatical frameworks. In essence, the idea is that the verb encodes a propositional shell in the sense that the verb is a full sentence in disguise - following a tradition going back at least to Frege. In generative grammar, theoretical principles such as the Theta Criterion capture the adicities that verbs have by requiring that the verb's arguments be present in the syntactic structure. The view is that the adicities of a verb are part of the verb's meaning and that the latter in part determines the realization of arguments. As stated by Levin and Rappaport Hovav in their comprehensive overview of argument realization: 'We have emphasized that not only is the structural facet of meaning relevant to argument realization generalizations, but so is the root [...]' (Levin & Rappaport Hovav 2005: 238), where the root is the idiosyncratic properties of a verb. The current paper aims to show that this may not be true as far as the grammar is concerned. In addition, the paper will demonstrate how Neo-Davidsonian logical forms can be transparently generated by the syntax.

* I would like to thank the audience at SALT, in particular Lucas Champollion, Jane Grimshaw and Angelika Kratzer. Special thanks to Angelika Kratzer, Paul Pietroski and Barry Schein for many discussions of the issues in the present paper.

The paper is organized as follows. Section 2 discusses evidence for severing thematic arguments from the verb. Section 3 gives a syntax and a mapping hypothesis such that the syntax maps transparently onto Neo-Davidsonian logical forms. Compositionality and Conjunctive semantics is discussed briefly in section 4, before section 5 concludes the paper.

2 Severing thematic arguments

In this section, I will present a series of arguments that supports the view that verbs do not take thematic arguments. The arguments will take the following form: They will show that Neo-Davidsonian logical forms, what I will refer to as full thematic separation, are the correct logical forms for certain data. These logical forms presuppose that verbs only take an event variable and that they do not take other arguments.[1]

Davidson (1967) famously suggested that an event variable is crucial to the representation of verbal meaning. Concretely, he suggests the representation in (2) for (1).

(1) Jones buttered the toast.

(2) ∃e[buttering(e, Jones, the toast)]

(2) says that there are events of buttering of which John is the Agent and the toast is the Theme. Davidson argues that these event representations are well-suited to capture important entailment relations. Consider the examples in (3)-(7).

(3) Jones buttered the toast.

(4) Jones buttered the toast slowly.

(5) Jones buttered the toast slowly in the bathroom.

(6) Jones buttered the toast slowly in the bathroom with a knife.

(7) Jones buttered the toast slowly in the bathroom with a knife at midnight.

In these examples, (7) entails (3), (4), (5), and (6); (6) entails (3), (4), and (5); (5) entails (3) and (4); (4) entails (3). This follows straightforwardly if there is an event modifier common to all the modifiers. The modifiers can then be linked by conjunction, in which case the entailments would follow as a natural consequence of conjunction reduction.

(8) ∃e[buttering(e, Jones, the toast) & Slow(e) & In(e, the bathroom) & With(e, a knife) & At(e, midnight)]

1 See Davidson (1967), Parsons (1990), Lasersohn (1995), Bayer (1996), Rothstein (1998), Landman (2000), and Tenny & Pustejovsky (2000) for a summary of the traditional arguments in favor of events.

Immediately after Davidson presented the proposal in (2), Castañeda (1967) argued that the thematic arguments could be severed from the verb. That is, (2) could rather be represented as in (9), where thematic relations are independent two-place predicates.

(9) ∃e[buttering(e) & Agent(e, Jones) & Theme(e, the toast)]

This is the Neo-Davidsonian proposal that Parsons (1990) takes up and develops in great detail (see also already Bartsch (1976); Carlson (1984); Higginbotham (1985, 1986); Taylor (1985); Krifka (1989, 1992)). [2]

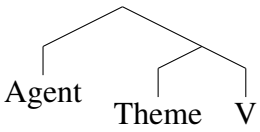
2.1 Tests for severing thematic arguments

Schein (1993) pushes the Neo-Davidsonian idea and puts forward arguments to show that we need the representation in (9), a representation that he refers to as full thematic separation. Schein's project is to argue that lexical decomposition is not sufficient. This is different from what Parsons (1990) argued, since Parsons would be happy if all decomposition is assigned to the lexicon. That is, we could stipulate the meaning postulate in (10) and this would suffice for him. (10) shows that a verb has lexical adicities in the grammar but that the lexical entry is interpreted such that the verb does not have lexical adicities.

(10) 'V(e, F, G)' is true ↔ ∀*x*(Agent(e, *x*) ↔ F*x*) ∧ V*e ∧ ∀*x*(Theme(e, *x*) ↔ G*x*) (Schein 1993: 9)

Schein (1993: 10) says that 'The argument for a radical decomposition is an argument that decomposition enters into the logical syntax'. The project is then to argue that (10) is not sufficient. The way Schein makes this argument is to put a Theme in between the Agent and the verb. If the Agent is not lexically represented on the verb, but rather introduced by structure separate from the verb, the Agent can be the agent of an event that is not that of the verb. A graphical depiction is given in (11).

(11)



Schein introduces such a case involving a distributive quantifier as the Theme. Such a Theme may induce a mereological partition relation between the event of Agent and the event of the verb. Importantly, though, in this case no substantive verbal

2 Since Gruber (1965) and Jackendoff (1972), there has been a lot of discussion of what the appropriate thematic roles are. See Dowty (1991) for arguments that we can only define prototypical roles, though Schein (2002) argues against this.

meaning is added. There is not a substantial semantic relation to the event of the verb, as e.g., a causative would contribute, but simply the mereological relation.

Schein's discussion centers around cases like (12)-(15). I will in what follows concentrate on (12).

(12) Three video games taught every quarterback two new plays.
Intended reading: 'Between the three of them, the video games are responsible for the fact that each quarterback learned two new plays.'

(13) Three agents sold (the) two buildings (each) to exactly two investors.

(14) Three letters of recommendation from influential figures earned the two new graduates (each) two offers.

(15) Three automatic tellers gave (the) two new members (each) exactly two passwords.

One may wonder why Schein adds the third NP *two new plays* in (12). The reason is that this eliminates the possibility that the crucial universal *every quarterback* in (12) denotes a group, e.g., *the quarterbacks*, in which case one could possibly analyze (12) as akin to *The games taught the quarterbacks*. In the example at hand, though, the universal has to denote a genuine quantifier since it has an indefinite that depends on it. The claim is that the mereological/part-whole relation among events ($e' \leq e$) connects quantification over quarterbacks and their solitary events to the larger event where three video games are the teachers (Schein 1993: 8). So *every quarterback* and *three video games* are cumulatively related, but *every quarterback* also seems to behave like an ordinary distributive quantifier phrase in its relation to *two new plays*, as Kratzer (2000) makes clear. This creates the problem that Schein tries to solve.

(Schein 1993: 8, 57) suggests a logical form for (12), namely (16), where *INFL* means the Agent event.[3]

(16) $\exists$e(teach(e)
$\wedge$ $\exists$e([$\exists X$: 3(X) $\wedge$ $\forall x(Xx \rightarrow Gx)$]$\forall x$(INFL($e$, x) $\leftrightarrow$ Xx)
$\wedge$ [every y: Qy] [$\exists e'$: $e' \leq e$]($\forall z$(TO(e', z) $\leftrightarrow$ $z = y$)
$\wedge$ [$\exists Z$: 2 (Z) $\wedge$ $\forall z(Wz \rightarrow Pz)$]$\forall z$(OF($e'$, z) $\leftrightarrow$ Wz)))[4]

3 A brief note about Schein's take on plurals, which is important for understanding his logical forms: A plural like *the As* is a second-order description of a predicate: a predicate such that if it holds of x, x is an A. This means that *the cats* comes out as a definite second-order description:

(i) $\iota Y(\exists yYy \wedge \forall y(Yy \leftrightarrow cat(y))$

4 Brasoveanu (2010) and Champollion (2010a) argue that event variables are not required in this logical form. Although they code the mereology differently, it is not clear to me that this is an argument against having events in the logical forms, given the existence of many independent arguments for

We can spell this out in plain(er) English as in (17).

(17) There is an event *e*, and e is a teaching,
and a three-membered plurality *X* comprising only video games, such that for every *x*, *x* is an agent of *e* just if it is among those three in *X*,
and for every quarterback *y*, there is a part *e'* of *e*, such that the targets of the teaching are all and only the quarterbacks,
and there is a two-membered plurality *Z*, comprising only plays, such that the content of the teaching *e'* was all and only the plays of *Z*.

We see that the part-whole relation among events ($e' \leq e$) connects quantification over quarterbacks and their solitary events to the larger event where three video games are the teachers (Schein 1993: 8). Notice that in the logical form above, the Agent and the Theme are scopally independent of each other and also of the verb. Here is what Schein says about the interpretation of (16).

(18) It is [...] essential to the meaning of [(12)] that the θ-role bound into by the subject not occur within the scope of other quantifiers, as in [(16)], and that the action of the three video games be related mereologically to what happened to the individual quarterbacks (Schein 1993: 57).

Schein devotes a lot of time to showing that if *teach* is a polyadic predicate, we do not get the correct logical forms. That is, in (19), either the universal will be inside the scope of the plural, or the reverse, and all thematic relations will be within the scope of any quantifiers.

(19) $[\exists X\colon 3(X) \wedge \forall x(Xx \rightarrow Gx)]$ [every y: Qy] $[\exists Z\colon 2(Z) \wedge \forall z(Zz \rightarrow Pz)]$
$\exists e$ teach(*X, y, Z, e*) (Schein 1993: 57)

As Schein points out, the problem for such polyadic logical forms is to find a meaning that relates individual objects to plural objects. From the point of view of entries such as (19), the difference between (12) and (20) is only a matter of scope. The logical form is given in (21).

(20) Every quarterback was taught two new plays by three video games.

(21) [every y: Qy] $[\exists Z\colon 2(Z) \wedge \forall z(Zz \rightarrow Pz)]$ $[\exists X\colon 3(X) \wedge \forall x(Xx \rightarrow Gx)]$
$\exists e$ teach(*X, y, Z, e*) (Schein 1993: 58)

But the meaning of (12) is crucially different in ways that scope does not reflect. In (21), all the NPs related to plural objects occur in the scope of the quantifier over individual objects (*every quarterback*). This is different in (12) since one of these

events (see e.g., Parsons (1990)). So even if one were to grant that Schein's argument did not go through, there are still other arguments for events that to my knowledge have not been explained away.

NPs has escaped, as Schein puts it. I will not go through all the other illustrations Schein provides of why polyadic predicates fail to give the correct meanings. Instead I refer the reader to chapter 4 of his book for a comprehensive discussion.

Kratzer (2000) furthermore shows that it is technically possible to get around Schein (1993)'s argument for severing the Agent. I will not repeat her proof of this here, but just emphasize, as she does, what one has to buy if one were to do this. She shows that we need 1) A complicated semantic type for the direct object position of the verb, and 2) to posit different argument structure for the verb in the object language and in the metalanguage. Many semanticists, including Kratzer, argue that this is not a price we should be willing to pay, and she goes on to show that severing the Agent makes it possible to do without these two assumptions.

Notice that so far we have only seen a claim that Agents have to be fully severed from the verb. This is similar to the claims in Kratzer (1996) and Marantz (1997). In fact, Schein (1993) leaves open the possibility that 'V(e) & Theme(e, x)' could be abbreviated 'V(e, x)'. Although the latter collapses verb and thematic role, the Theme argument x is still separated from any other nominal argument. Kratzer (2000) tries to replicate Schein's test for Agents for Themes. That is, Kratzer pursues the same logic as Schein did for severing Agents. That is, she tries to come up with examples that show that thematic separation for Themes is crucially required. Her main example is (22).

(22) Every copy editor caught 500 mistakes in the manuscript.

Kratzer claims that (22) does not have a cumulative reading saying that between them, the copy editors caught a total of 500 mistakes. Passivizing the example does not help either, as (23) shows.

(23) 500 mistakes in the manuscript were caught by every copy editor.

The non-existent reading, i.e., the cumulative one, would have the logical form in (24).

(24) $\exists e \exists x$[500 mistakes(x) & theme(x)(e) & $\forall$y [copy.editor(y) $\rightarrow$ $\exists$e'[e' $<$ e & agent(y)(e') & catch(e')]]]

(24) says that 500 mistakes were the plural Theme of an event in which every copy editor was a catcher. Kratzer argues that the fact that (24) does not exist does not show that Theme arguments are not Neo-Davidsonian, but she also argues that there is no evidence that Theme arguments are Neo-Davidsonian. Her main point is that the kind of argument Schein gave for Agents does not extend to Themes.

Other work argues that Themes need to be severed. Williams (2005, 2008) present a range of arguments for severing the Theme in Mandarin Chinese and Igbo

and Schein (2003) provides a different argument for severing the Theme.[5] I turn to that now.

Schein's discussion is based on examples like (25).

(25) The cockroaches suffocated each other.

The sentence in (25) could be true 'even where only the entire group sits at the cusp of catastrophe' (Schein 2003: 349). Put differently, had there been only one less cockroach, they would all have made it. Schein (2003: 350) observes that none of the following paraphrases are accurate to capture this reading.

(26) The cockroaches each suffocated the others.

(27) The cockroaches each suffocated some of the others.

(28) The cockroaches suffocated, each suffocating the others.

(29) The cockroaches suffocated, each suffocating some of the others.

The problem is that all the paraphrases assign *each* a scope that includes the verb. Schein gives the logical form in (30) which has the paraphrase in (31) (Schein 2003: 350). The logical form itself is not that important since Schein has other fish to fry as well in this paper; the paraphrase should be the focus of attention.

(30) $\exists$e[the X : cockroaches[X]](Agent[e, X] & suffocate[e] & Theme[e, X] & [ιX : Agent[e, X]][Each x : Xx] [$\iota e'$: Overlaps[e', e] & Agent[e', x]] [$\exists e''$: t(e'') $\leq$ t(e')] [ιY : Others[x, Y] & Agent[e'', Y]] Theme[e', Y])

(31) 'The cockroaches suffocate themselves,
(with) them each acting
against the others that acted.'

The main point here is that each cockroach is in a thematic relation to some event E that contributed to the mass suffocation. But E is not itself a suffocation of one cockroach by another. Schein concludes that the scope of *each* includes the thematic relation, but not the event predicate *suffocate*.

Some readers may object that there are many independent issues that need to be dealt with concerning reciprocity before the above argument can be accepted. Here I will not discuss reciprocity in detail, but refer the reader to Dotlačil (2010) and LaTerza (2011) for further arguments that reciprocity requires full thematic separation.

Based on the cases discussed here (and the references not discussed explicitly), it seems valid to conclude that full thematic separation is required for some cases, hence it is an option in Universal Grammar. A range of other arguments are discussed in Lohndal (To appear) and I refer the reader to that paper.

5 Schein (2011) provides yet another argument. See also Williams (2009) for a general critique of Kratzer's reliance on cumulativity.

3 Spelling out Neo-Davidsonian logical forms

If logical forms are Neo-Davidsonian in nature, this view raises a number of serious challenges for the syntax-semantics interface.[6] In what follows, I will outline a few of these. For reasons of space, the discussion will be rather limited, but I refer the interested reader to Lohndal (In progress) for much more discussion.

Over the years, a lot of work has argued that syntactic/structural aspects are more important than semantic/lexical aspects of individual words, cf. van Hout (1992, 1996); Schein (1993, 2003, 2011); Gomeshi & Massam (1994); Tenny (1994); Harley (1995); Kratzer (1996); Marantz (1997); Ritter & Rosen (1996, 1998); Borer (2005b,c); Cuervo (2010); Travis (2010); Boeckx (2010). Borer, in particular, has stressed the importance of functional structure for the interpretation of sentences once verbs are no longer sentences in disguise. This can be seen very clearly in the significant literature on the functional element that introduces Agents, cf. Chomsky (1995); Harley (1995); Sternefeld (1995); Kratzer (1996); Stechow (1996); Alexiadou, Anagnostopoulou & Schäfer (2006); Folli & Harley (2007); Pylkkänen (2008); Ramchand (2008); Sailor & Ahn (2010). However, if both the Agent *and* the Theme are severed, as on a full Neo-Davidsonian approach, we want to know what such a syntax looks like.

Relatedly, Neo-Davidsonian logical forms that encompass full thematic separation could imply a specific view on semantic composition, namely that logical forms basically consist of conjuncts. I will assume such a view for the purposes of this paper, following Schein (1993, In press), Pietroski (2005, 2008, 2011). However, if one wants to make different assumptions, Champollion (2010b,c) shows how to give a type-driven semantic analysis based on a syntax where functional elements introduce thematic arguments.

Since Chomsky (1965) it has been common to assume that a verb like *kick* has syntactic requirements such that it required a subject and an object. Similarly, at logical form, *kick* was dyadic: kick(x,y). Davidson's work added an event variable so that verbs like *kick* are triadic: kick(e,x,y). As we have seen, the work of Kratzer (1996) argues that *kick* only requires an object in the syntax, but that it is still dyadic at logical form: kick(e,y). Full-fledged Neo-Davidsonians claim that *kick* is monadic at logical form (kick(e)), and at least Borer (2005b)'s work assumes that *kick* doesn't have any syntactic requirements. Here I am going to restore the isomorphism from the early days of generative grammar by arguing that if verbs like *kick* have an event variable at logical form, such verbs better have an event variable in the syntax. By extension, if there are two event variables that are mereologically related at logical

6 See Krifka (1992) for an early and preliminary attempt at providing a syntax-semantics mapping that relies on syntactic features to select the proper thematic roles. Bayer (1996) argues that Krifka's account is not adequate and provides a different account.

form, then these two event variables should be present in the syntax as well. In order to capture this, I will introduce an E(vent)P(hrase) in the syntax to encode relations between events. Notice that this approach encodes a notion of transparency where transparency really means transparency, following the spirit of Montague (1974).

I will make the following syntactic assumptions:

(32) a. Agents are introduced by Voice.

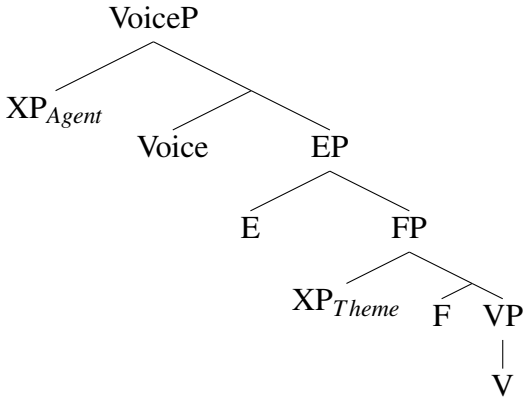
b. Themes are introduced by F.[7]

c. The verb is merged prior to all functional projections.[8]

d. For causative structures, there is an additional head E that relates one event to another. There may be different flavors of this head depending on the exact nature of the events (e.g., causation or mereology).

Based on these assumptions, let us consider the following structure:

(33)



I will now provide the derivation of this structure.

When F has merged with VP and then XP_{Theme} is supposed to Merge with the FP phrase, such a merger cannot take place.[9] Instead, for XP_{Theme} to merge with FP, the complement of F needs to be spelled out. Because of the relational character of Bare Phrase Structure (Muysken 1982; Chomsky 1995), F is now a head and can merge with the phrase XP_{Theme}. That is, Spell-Out results in *pruned structures* where

7 See Lin (2001); Borer (2005a); Bowers (2010).

8 Borer (2005a); though see Travis (2010).

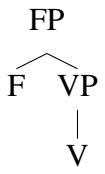
9 The following derivational constraints ensures this:

(i) *[XP YP]

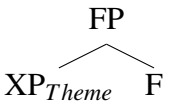
(i) is a derivational constraint that says that two elements that can only be phrases cannot be merged. I take no position on the nature of this constraint; see Speas (1990), Uriagereka (1999), Alexiadou & Anagnostopoulou (2001, 2007); Richards (2010), Chomsky (2008, 2010) and Kayne (2010) for much discussion.

nothing is left in F's original complement after Spell-Out. (34) shows the structure before Spell-out and (35) the structure after Spell-out and merger of Theme.

(34)

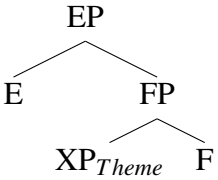


(35)



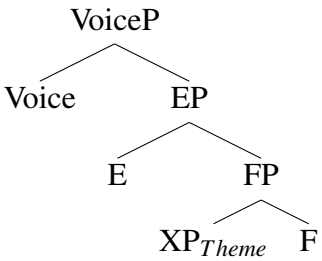
The next step of the derivation gives the structure in (36), where the E head has been merged. No application of Spell-Out is triggered.

(36)

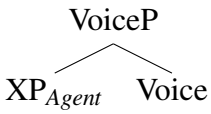


The next element to be merged is the Voice head (37). Then the XP_{Agent} is supposed to be merged into the structure. But VoiceP and XP_{Agent} cannot be merged, so again, the complement of Voice needs to be spelled out. The resulting structure is given in (38).

(37)

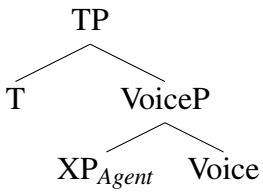


(38)

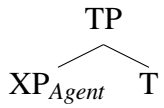


The VoiceP in (38) can now be merged with further heads, but as soon as a new phrase is supposed to be merged, Spell-Out will be triggered again. Let us for concreteness move the subject to the canonical subject position, which in English I take to be SpecTP. First T merges with VoiceP, creating a TP, as shown in (39). When the subject, XP_{Agent}, moves, Spell-Out is triggered again, so that we end up with (40).

(39)



(40)



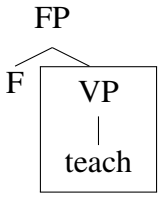
With this syntax, we can now see how the mapping from syntax to logical forms works.

Consider a slightly shorter version of Schein (1993)'s sentence.

(41) Three video games taught every quarterback.

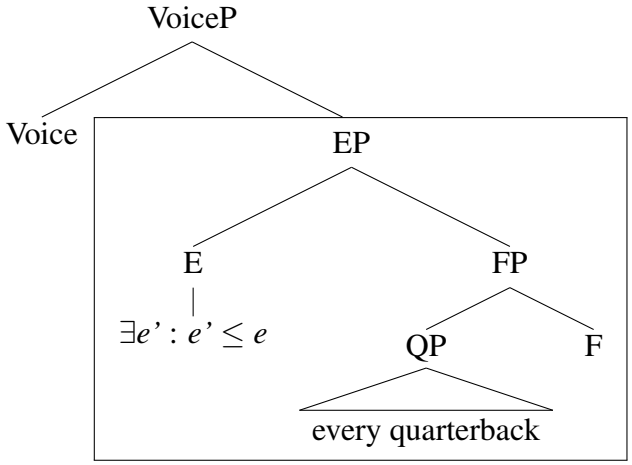
We get the following derivations, where the arrows signal the mapping to (a simplified) logical form.

(42)



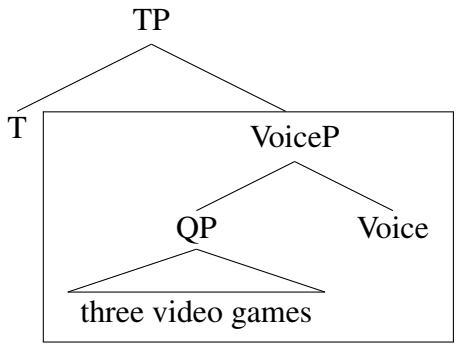
(43) $\Longrightarrow$ teach(e)

(44)



(45) $\Longrightarrow$ [every y: Qy] [$\exists e' : e' \leq e$](Theme(e', y))

(46)



(47) $\Longrightarrow$ [$\exists X$: 3(X) $\wedge$ $\forall x$($Xx \rightarrow Gx$)](Agent(e, x)

I assume that the Spell-Out domains are added to a stack, so that at the end of the derivation, these domains are all conjoined. At the end, existential closure is added, and we end up with the following logical form:

(48) $\exists$e([$\exists X$: 3(X) $\wedge$ $\forall x$($Xx \rightarrow Gx$)](Agent(e, x) $\wedge$ teach(e)
$\wedge$ [every y: Qy] [$\exists e'$: $e' \leq e$](Theme(e', y))

We see that the mapping relies on a given syntax plus translations of the syntactic terminals into appropriate logical notation (whatever that turns out to be).

I want to emphasize that the order of the functional projections and the Spell-Out domains need to be exactly as described above. An alternative would be to say that each application of Merge corresponds to a conjunct at logical form. However, based on the syntactic structure above, this would give us the following logical form:

(49) $\exists$e([$\exists X$: 3(X) $\wedge$ $\forall x$($Xx \rightarrow Gx$)](Agent(e, x) $\wedge$ teach(e)
$\wedge$ [$\exists e'$: $e' \leq e$] $\wedge$ [every y: Qy](Theme(e', y))

This logical form is not equivalent to the logical form in (16). Furthermore, (49) seems to predict that (49) entails (50), where the mereological relation has been eliminated.

(50) $\exists$e([$\exists X$: 3(X) $\wedge$ $\forall x$($Xx \rightarrow Gx$)](Agent(e, x) $\wedge$ teach(e)
$\wedge$ [every y: Qy](Theme(e', y))

In (50), the event variables are not connected, so the logical form does not express how e' relates to e.

The next section will briefly discuss how compositionality relates to a Conjunctivist semantics.

4 Conjunction and compositionality

On the present approach, a question that arises is how compositionality works. I have said above that I've assumed that the main composition principle at logical

form is conjunction. We have just seen that I have taken this to mean that Spell-Out domains are 'chained' together by way of conjunction. Bayer (1996) argues that the neo-Davidsonian approach comes in two flavors: One flavor is a lexical flavor, where the denotation of the verb contains slots for thematic predicates (Bayer 1996: 4):

(51) chase = $\lambda y \lambda x \lambda e$[chase'(e) $\wedge$ $\theta_{SU,chase'}$(x)(e) $\wedge$ $\theta_{DO,chase'}$(y)(e)]

Bayer calls this approach the lexical strategy. The other flavor is what Bayer calls the compositional approach. On this approach, the meaning of a verb is a set of events.

(52) chase = λe[chase'(e)]

As Bayer points out, on this approach, thematic roles are linked to the verbal meanings with the events that correspond to the meaning of the verb. The approach I am pursuing is clearly of this second type.

Several researchers have objected to me that compositionality necessarily involves lambdas. If the computation is not type-driven by way of lambdas, the computation is not compositional. There are several things that are wrong with this claim.

First, lambdas just stand for functions. As Collins (2011: 43) puts it, 'The original function and its λ-abstraction are equivalent as so interpreted, as the abstraction simply names the function that interprets the original predicate (open sentence) as defined in M[odel], where any occurrence of a variable is replaced by what the function *f* takes as its argument'. So lambdas per se should not be required given that this is all they do. And as Champollion (2010b,c) has shown, one can generate the same interpretation as above by way of a type-driven computation where functional heads introduce arguments. This should not come as a surprise: a powerful tool such as the lambda-calculus can clearly do the same as a less powerful tool.

Second, it is important to be clear on what compositionality amounts to. Here is a standard definition: 'Compositionality is a property that a language may have and may lack, namely the property that the meaning of any complex expression is *determined* by the meanings of its parts and the way they are put together' (Pagin & Westerståhl 2010a: 250). There are several issues to bring out here: One is that compositionality is not a given - it could very well be that natural language is not compositional, as e.g., Fodor (2001) claims.[10] Another is that we need a definition of what meaning is. If we assume that meanings are instructions in the sense of Chomsky (2000); Pietroski (2011), then a sentential instruction depends on the instructions that it contains. Conjunction is then hardly any less or any more compositional than other theories.

10 See Pagin & Westerståhl (2010b) for a discussion of common objections to compositionality.

There is also reason to think that rather than focusing on compositionality, what is really important is *systematicity*. The rules that relate the parts to the whole have to be systematic. As Hornstein (1995: 386) argues, 'That this systematicity is not as strictly compositional as it might be does not imply that it fails to account for the productive capacity displayed by native speakers'. This argument gets even stronger if it is the case that language isn't really compositional, because even if language isn't compositional, it surely is systematic.

There is not space to outline this view in more detail, but see Lohndal (In progress) for more discussion.

5 Conclusion

The paper has presented evidence for full thematic separation, that is, that Neo-Davidsonian representations are required. Verbs only have an event variable; they do not take thematic arguments. Based on this, the paper has developed a syntax and a mapping hypothesis from syntax to logical forms where each Spell-Out domain corresponds to a conjunct at logical form. Lastly, the paper has also discussed how to think about compositionality within a Conjunctivist semantics.

References

Alexiadou, Artemis & Elena Anagnostopoulou. 2001. The Subject-in-Situ Generalization and the Role of Case in Driving Computations. *Linguistic Inquiry* 32. 193–231.

Alexiadou, Artemis & Elena Anagnostopoulou. 2007. The Subject-in-Situ Generalization Revisited. In Hans-Martin Gärtner & Uli Sauerland (eds.), *Interfaces + Recursion = Language?*, 31–60. Berlin: Mouton de Gruyter.

Alexiadou, Artemis, Elena Anagnostopoulou & Florian Schäfer. 2006. The properties of anticausatives crosslinguistically. In Mara Frascarelli (ed.), *Phases of Interpretation*, 187–211. Berlin: Mouton de Gruyter.

Bartsch, Renate. 1976. *The Grammar of Adverbials*. Amsterdam: North-Holland.

Bayer, Samuel Louis. 1996. *Confession of a Lapsed Neo-Davidsonian*: Brown University dissertation.

Boeckx, Cedric. 2010. Defeating Lexicocentrism: Part A of Elementary Syntactic Structures. Ms., ICREA/UAB.

Borer, Hagit. 2005a. *Structuring Sense*. Oxford: Oxford University Press.

Borer, Hagit. 2005b. *Structuring Sense: In Name Only*. Oxford: Oxford University Press.

Borer, Hagit. 2005c. *Structuring Sense: The Normal Course of Events*. Oxford: Oxford University Press.

Bowers, John. 2010. *Arguments as Relations*. Cambridge, MA: MIT Press.
Brasoveanu, Adrian. 2010. Modified Numerals as Post-suppositions. In Maria Aloni, Harald Bastiaanse, Tikitu de Jager & Katrin Schulz (eds.), *Logic, Language and Meaning, Lecture Notes in Computer Science*, 203–212. Berlin: Springer.
Carlson, Greg. 1984. Thematic roles and their role in semantic interpretation. *Linguistics* 22. 259–279.
Castañeda, Hector-Neri. 1967. Comments. In Nicolas Resher (ed.), *The Logic of Decision and Action*, 104–112. Pittsburgh: University of Pittsburgh Press.
Champollion, Lucas. 2010a. Cumulative readings of *every* do not provide evidence for events and thematic roles. In Maria Aloni, Harald Bastiaanse, Tikitu de Jager & Katrin Schulz (eds.), *Logic, Language and Meaning, Lecture Notes in Computer Science*, 213–222. Berlin: Springer.
Champollion, Lucas. 2010b. *Parts of a whole: Distributivity as a bridge between aspect and measurement*: University of Pennsylvania dissertation.
Champollion, Lucas. 2010c. Quantification in event semantics. Talk given at the 6th International Symposium of Cognition, Logic and Communication.
Chomsky, Noam. 1965. *Aspects of the Theory of Syntax*. Cambridge, MA: MIT Press.
Chomsky, Noam. 1995. *The Minimalist Program*. Cambridge, MA: MIT Press.
Chomsky, Noam. 2000. Minimalist Inquiries: The Framework. In Roger Martin, David Michaels & Juan Uriagereka (eds.), *Step by Step: Essays on Minimalist Syntax in Honor of Howard Lasnik*, 89–155. Cambridge, MA: MIT Press.
Chomsky, Noam. 2008. On phases. In Carlos Otero, Robert Freidin & María-Luísa Zubizarreta (eds.), *Foundational Issues in Linguistic Theory: Essays in Honor of Jean-Roger Vergnaud*, 133–166. Cambridge, MA: MIT Press.
Chomsky, Noam. 2010. Restricting stipulations: consequences and challenges. Talk given at the University of Stuttgart, March 24.
Collins, John. 2011. *The Unity of Linguistic Meaning*. Oxford: Oxford University Press.
Cuervo, María Cristina. 2010. Against ditransivity. *Probus* 22(151-180).
Davidson, Donald. 1967. The Logical Form of Action Sentences. In Nicolas Resher (ed.), *The Logic of Decision and Action*, 81–95. Pittsburgh: University of Pittsburgh Press.
Dotlačil, Jakub. 2010. *Anaphora and Distributivity: A study of same, different. reciprocals and others*: Utrecht University dissertation.
Dowty, David. 1991. Thematic proto-roles and argument selection. *Language* 67. 547–619.
Fodor, Jerry. 2001. Language, thought and compositionality. *Mind & Language* 16. 1–15.
Folli, Raffaella & Heidi Harley. 2007. Causation, Obligation, and Argument Struc-

ture: On the Nature of Little v. *Linguistic Inquiry* 38. 197–238.
Gomeshi, Jila & Diane Massam. 1994. Lexical/Syntactic Relations Without Projection. *Linguistic Analysis* 24. 175–217.
Gruber, Jeffrey S. 1965. *Studies in Lexical Relations*: MIT dissertation.
Harley, Heidi. 1995. *Subjects, Events and Licensing*: MIT dissertation.
Higginbotham, James. 1985. On Semantics. *Linguistic Inquiry* 16. 547–593.
Higginbotham, James. 1986. Linguistic Theory and Davidson's Program. In Ernest Lepore (ed.), *Inquiries into Truth and Interpretation*, 29–48. Oxford: Basil Blackwell.
Hornstein, Norbert. 1995. Putting Truth into Universal Grammar. *Linguistics and Philosophy* 18. 381–400.
van Hout, Angeliek. 1992. Linking and projection based on event structure. Ms., Tilburg University.
van Hout, Angeliek. 1996. *Event Semantics of Verb Frame Alternations*: Tilburg University dissertation.
Jackendoff, Ray. 1972. *Semantic Interpretation in Generative Grammar*. Cambridge, MA: MIT Press.
Kayne, Richard S. 2010. Why Are There No Directionality Parameters. Ms., New York University.
Kratzer, Angelika. 1996. Severing the External Argument from the Verb. In Johan Rooryck & Laurie Zaring (eds.), *Phrase Structure and the Lexicon*, 109–137. Dordrecht: Kluwer.
Kratzer, Angelika. 2000. The Event Argument: Chapter 2. Ms., University of Massachusetts.
Krifka, Manfred. 1989. Nominal Reference, Temporal Constitution and Quantification in Event Semantics. In Renate Bartsch, J. F. A. K. Benthem & P. van Emde Boas (eds.), *Semantics and Contextual Expression*, 75–115. Dordrecht: Foris.
Krifka, Manfred. 1992. Thematic relations as links between nominal reference and temporal constitution. In Ivan Sag & Anna Szabolcsi (eds.), *Lexical Matters*, 29–53. Stanford: CSLI.
Landman, Fred. 2000. *Events and Plurality*. Dordrecht: Kluwer.
Lasersohn, Peter. 1995. *Plurality, Conjunction and Events*. Dordrecht: Kluwer.
LaTerza, Chris. 2011. Floating Reciprocals. Ms., University of Maryland.
Levin, Beth & Malka Rappaport Hovav. 2005. *Argument Realization*. Cambridge: Cambridge University Press.
Lin, Tzong-Hong. 2001. *Light Verb Syntax and the Theory of Phrase Structure*: University of California, Irvine dissertation.
Lohndal, Terje. In progress. *Without Specifiers: Phrase Structure and Events*: University of Maryland dissertation.
Lohndal, Terje. To appear. Towards the End of Argument Structure. In María Cristina

Cuervo & Yves Roberge (eds.), *The End of Argument Structure?*, Bingley: Emerald.

Marantz, Alec. 1997. No escape from syntax: don't try morphological analysis in the privacy of your own lexicon. In A. Dimitriadis, L. Siegel, C. Surek-Clark & A. Williams (eds.), *Proceedings of PLC 21*, 201–225.

Montague, Richard. 1974. *Formal Philosophy*. New Haven: Yale University Press.

Muysken, Pieter. 1982. Parametrizing the notion "Head". *Journal of Linguistic Research* 2. 57–75.

Pagin, Peter & Dag Westerståhl. 2010a. Compositionality I: Definitions and Variants. *Philosophy Compass* 5. 250–264.

Pagin, Peter & Dag Westerståhl. 2010b. Compositionality II: Arguments and Problems. *Philosophy Compass* 5. 265–282.

Parsons, Terence. 1990. *Events in the Semantics of English*. Cambridge, MA: MIT Press.

Pietroski, Paul. 2005. *Events & Semantic Architecture*. Oxford: Oxford University Press.

Pietroski, Paul. 2008. Minimalist meaning, internalist interpretation. *Biolinguistics* 2. 317–341.

Pietroski, Paul. 2011. Minimal semantic instructions. In Cedric Boeckx (ed.), *The Oxford handbook of linguistic minimalism*, 472–498. Oxford: Oxford University Press.

Pylkkänen, Liina. 2008. *Introducing Arguments*. Cambridge, MA: MIT Press.

Ramchand, Gillian. 2008. *Verb Meaning and the Lexicon: A First Phase Syntax*. Cambridge: Cambridge University Press.

Richards, Norvin. 2010. *Uttering Trees*. Cambridge, MA: MIT Press.

Ritter, Elizabeth & Sara Thomas Rosen. 1996. Strong and Weak Predicates: Reducing the lexical burden. *Linguistic Analysis* 26. 29–62.

Ritter, Elizabeth & Sara Thomas Rosen. 1998. Delimiting events in syntax. In William Greuder & Miriam Butt (eds.), *The Projection of Arguments*, 97–134. Stanford: CSLI.

Rothstein, Susan. 1998. Introduction. In Susan Rothstein (ed.), *Events and Grammar*, 1–11. Dordrecht: Kluwer.

Sailor, Craig & Byron Ahn. 2010. The Voices in our Heads. Talk given at Morphological Voice and its Grammatical Interfaces, June 25.

Schein, Barry. 1993. *Plurals and Events*. Cambridge, MA: MIT Press.

Schein, Barry. 2002. Events and the Semantic Content of Thematic Relations. In Gerhard Preyer & Georg Peters (eds.), *Logical Form and Language*, 263–344. Oxford: Oxford University Press.

Schein, Barry. 2003. Adverbial, descriptive reciprocals. *Philosophical Perspectives* 17. 333–367.

Schein, Barry. 2011. Event semantics. In Delia Graff Fara & Gillian Russell (eds.), *The Routledge Companion to the Philosophy of Language*, London: Routledge.
Schein, Barry. In press. *Conjunction Reduction Redux*. Cambridge, MA: MIT Press.
Speas, Margaret J. 1990. *Phrase Structure in Natural Language*. Dordrecht: Kluwer.
Stechow, Arnim von. 1996. The Different Readings of Wieder 'Again': A Structural Account. *Journal of Semantics* 13. 87–138.
Sternefeld, Wolfgang. 1995. Voice Phrases and their Specifiers. *FAS Papers in Linguistics* 3. 48–85.
Taylor, Barry M. 1985. *Modes of Occurrence: Verbs, Adverbs and Events*. Oxford: Blackwell.
Tenny, Carol. 1994. *Aspectual Roles and the Syntax-semantics Interface*. Dordrecht: Kluwer.
Tenny, Carol & James Pustejovsky. 2000. A History of Events in Linguistic Theory. In Carol Tenny & James Pustejovsky (eds.), *Events as Grammatical Objects*, 3–37. Stanford: CSLI.
Travis, Lisa. 2010. *Inner Aspect*. Dordrecht: Kluwer.
Uriagereka, Juan. 1999. Multiple Spell-Out. In Samuel David Epstein & Norbert Hornstein (eds.), *Working Minimalism*, 251–282. Cambridge, MA: MIT Press.
Williams, Alexander. 2005. *Complex Causatives and Verbal Valence*: University of Pennsylvania dissertation.
Williams, Alexander. 2008. Patients in Igbo and Mandarin. In Johannes Dölling, Tatjana Heyde-Zybatow & Martin Schäfer (eds.), *Event Structures in Linguistic Form and Interpretation*, 3–30. Berlin: Mouton de Gruyter.
Williams, Alexander. 2009. Themes, Cumulativity, and Resultatives: Comments on Kratzer 2003. *Linguistic Inquiry* 40. 686–700.

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