

Towards the End of Argument Structure

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Abstract

This paper discusses a range of arguments against the widespread assumption that verbs take thematic arguments. These arguments are based on facts involving, among other things, distributive readings and variable verbal adicity. Furthermore, the paper rebuts counterarguments put forward in recent work. In particular, the paper deals with claims based on idioms and argues that these do not undermine the claim that verbs do not take thematic arguments. Lastly the paper discusses possible consequences of this view for the syntax-semantics interface and claims that the mapping should rely on the functional structure of the sentence.

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 [...]'¹ (Levin and 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.

The traditional view where all the verb's arguments are part of the lexical specification of the verb has been challenged in recent years. In particular, Schein (1993) and Kratzer (1996, 2000) argue that external arguments or Agents should be severed from the verb, that is, not be part of the lexical specification of the verb.¹ Schein and Kratzer, however, disagree on whether internal arguments or Themes should be severed as well. The goal of the present paper is to take steps towards resolving the debate. I will argue that there are cases that support the claim that verbs do not take thematic arguments. If that is the case, it raises questions about the syntax-semantics interface. I will provide a preliminary discussion of these questions.

The paper is organized as follows. Section 2 presents a range of arguments against verbs taking thematic arguments. Section 3 deals with a particular counter-argument, namely that of idioms. In section 4, some of consequences of the present view are discussed before section 5 concludes the paper.

2 Arguments against lexical adicities

In this section, I will present a series of arguments supporting the view that verbs do not take thematic arguments. The arguments will take the following form: They will show

¹Similar claims have been advanced in non-generative frameworks such as Construction Grammar (Goldberg, 1995, 2006). Here I will not discuss this literature.

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.²

In the postscript to their book, Levin and Rappaport Hovav state the following, which is worth quoting at length:

In chapter 1 we stressed the importance of isolating the “grammatically relevant” facets of verb meaning. Most linguists take this type of meaning to be what we characterized as the “structural” components of verb meaning. How does this convergence fit in with our repeated assertion that the semantics of the root is important to many facets of argument realization? We suggest that the basic mapping from event structure to syntax is indeed governed by a relatively small set of semantic notions: the grammatically relevant facets of meaning expressed in an event structure. However, the semantics of the root determines the range of event structure a particular verb is associated with, the distribution of semantic cases, and the compatibility of a verb with particular modes of information-packaging.

It is perhaps fitting to conclude this book with the observation that the lexical semantics of the root determines in many complex ways different facets of argument realization. This observation is worthy of note in light a recent trend towards shifting the burden of explanation to extralexical factors. Although such factors are clearly present, the recognition that lexical semantic factors are still very relevant affirms research programs that pay close attention to the lexical semantics of verbs, despite the notoriously elusive nature of word meaning. (Levin and Rappaport Hovav, 2005, 241)

Many researchers have argued that properties of the verb influence or even determine how the verb’s arguments are realized. However, in the present paper I present arguments against this view.³ There have been a number of such arguments in the literature, as Levin and Rappaport Hovav mention; see Krifka (1989, 1992), Parsons (1990, 96-99), Schein

²See Davidson (1967), Parsons (1990), Lasersohn (1995), Bayer (1996), Rothstein (1998), Landman (2000), and Tenny and Pustejovsky (2000) for a summary of the traditional arguments in favor of events.

³An initial reason for thinking that this is the case is provided by the three verbs *eat*, *dine* and *devour*. These verbs all have roughly the same meaning, but quite different subcategorization requirements: *eat* is optionally transitive, *dine* is intransitive and *devour* is obligatorily transitive. Thanks to Lucas Champollion (p.c.) for reminding me of this.

(1993, 2003, 2011), Gomesi and Massam (1994), Ritter and Rosen (1996), Herburger (2000), Baker (2003), Borer (2005a,b), Marantz (2005), Williams (2005, 2008), Pietroski (2007), Boeckx (2010) and Cuervo (2010) for the verbal domain and Barker (1998) for the nominal domain. Here I focus on a few of these arguments, namely the ones presented by Parsons, Schein, Herburger and Pietroski. These arguments have never been gathered together in one place before so I think it will be useful to do that. Special attention will be devoted to the issue of whether Themes should be severed from the verb's argument structure or not.⁴

It is worth emphasizing that the present approach does not suggest to dispense with the event argument. I will return to some more discussion of this below.

2.1 Davidsonian versus Neo-Davidsonian representations

Let us start by briefly reviewing the history of the relevant literature.

Davidson (1967) suggests 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) $\exists e[\text{buttering}(e, \text{Jones}, \text{the toast})]$

(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 variable 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.

⁴Bayer (1996) presents a very long discussion of whether Neo-Davidsonian representations are better than Davidsonian logical forms. He concludes that they are not. Most of the issues I discuss below are not discussed by Bayer or discussed inadequately (like his discussion of Schein (1993)), so I will not engage in a detailed rebuttal of Bayer's claims in this paper.

- (8) $\exists e[\text{buttering}(e, \text{Jones, the toast}) \ \& \ \text{Slow}(e) \ \& \ \text{In}(e, \text{the bathroom}) \ \& \ \text{With}(e, \text{a knife}) \ \& \ \text{At}(e, \text{midnight})]$

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) $\exists e[\text{buttering}(e) \ \& \ \text{Agent}(e, \text{Jones}) \ \& \ \text{Theme}(e, \text{the toast})]$

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)). Dowty (1989) calls (2) the ‘ordered-argument’ method and (9) the ‘neo-Davidsonian’ method.⁵

Note that the original Davidsonian proposal lumped the event argument and the thematic arguments together at logical form. As I will argue, it is a virtue of the Neo-Davidsonian proposal that a distinction between the event argument and the thematic argument(s) is introduced. On a Neo-Davidsonian approach, verbs are monadic in the sense that they only have a single argument, namely the event argument. This offers a way to classify verbs in the sense that one can say that the event argument is what makes a lexical item a verb, though note that this requires that one insists that verbs and their corresponding gerunds are not synonyms (pace e.g., Parsons (1990)). I will not take on that task in this paper, as the goal is not to discuss the question of what makes a verb a verb.

It is important to point out that what both Davidson and Parsons call ‘logical form’ is not the same as the notion of logical form that syntacticians use, i.e., Logical Form, which is a syntactic level of representation (cf. May (1977, 1985)). As Hornstein (2002, 345) points out, the ‘conception of LF is analogous (*not* identical) to earlier conceptions of logical form (or logical syntax) [...] found in the work of philosophers like Frege, Russell, Carnap, and Strawson’. In many ways, Davidson and Parson’s logical forms are more like semantic or conceptual structures. Kratzer (1996, 110) cites Parsons (1993) saying that the theory in Parsons (1990) is a ‘proposal for the logical forms of sentences, unsupplemented by an account of how those forms originate by combining sentence parts’. On such a theory, one can for example argue that there is ordered argument association in the syntax and in conceptual structure, or one can argue that there is ordered argument association in the syntax but neo-Davidsonian association in conceptual structure. Yet another option is to argue that there is neo-Davidsonian association both in the syntax and conceptual structure. The latter is Schein’s project (Schein, 1993, 11), as I will illustrate in detail below. One can also take intermediate positions, as Kratzer (1996) does, where only the

⁵Since 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.

Agent is severed in the syntax (Kratzer is explicitly agnostic about conceptual structure). This issue will play an important role in the present chapter, and I will return to a more comprehensive discussion below.

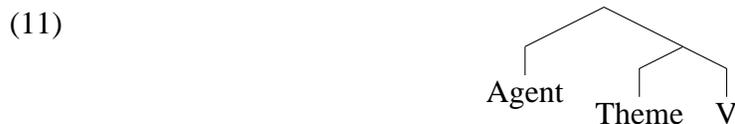
2.2 Severing the Agent

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.

$$(10) \quad \text{‘V}(e, F, G)\text{’ is true} \leftrightarrow \forall x(\text{Agent}(e, x) \leftrightarrow Fx) \wedge V^*e \wedge \forall x(\text{Theme}(e, x) \leftrightarrow Gx)$$

(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).



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 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. In order to make this clearer, let us see why a mereology of events is needed on a Neo-Davidsonian approach.

Consider the data in (12)-(13), from Schein (1993, 7).⁶

- (12) Unharmoniously, every organ student sustained a note on the Wurlitzer for sixteen measures.
- (13) In slow progression, every organ student struck a note on the Wurlitzer.

⁶See Ferreira (2005) for more discussion of this issue.

Schein argues that the reading for (12) where each student is related to a note on the Wurlitzer, that is, for each to have an event of his own, the quantifier must include a quantifier of events within its scope. Note that it is not the individual note that is unharmonious but the ensemble. Each of the students only play a part in the larger action. There is no other way to get this reading, and the sentence would be false if, for example, one of the students keeps it going for eight measures and then another student does the other 8, as Schein observes. The same argument can be made for (13). The solitary events performed by the students can only be related to the larger one as parts of the whole. Summarizing, the mereological relation is encoded through a quantifier which includes the condition that e' is part of e ($e' \leq e$).

Now that we have seen why mereological relations are required, let us turn to the central data points. Schein's discussion centers around cases like (14)-(17). I will in what follows concentrate on (14).

- (14) 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.'
- (15) Three agents sold (the) two buildings (each) to exactly two investors.
- (16) Three letters of recommendation from influential figures earned the two new graduates (each) two offers.
- (17) 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 (14). The reason is that this eliminates the possibility that the crucial universal *every quarterback* in (14) denotes a group, e.g., *the quarterbacks*, in which case one could possibly analyze (14) 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 (14), namely (18), where *INFL* means the Agent event.⁷

⁷A 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:

- (18) $\exists e(\text{teach}(e)$
 $\wedge \exists e([\exists X: 3(X) \wedge \forall x(Xx \rightarrow Gx)]\forall x(\text{INFL}(e, x) \leftrightarrow Xx)$
 $\wedge [\text{every } y: Qy] [\exists e' : e' \leq e](\forall z(\text{TO}(e', z) \leftrightarrow z = y)$
 $\wedge [\exists Z: 2(Z) \wedge \forall z(Wz \rightarrow Pz)]\forall z(\text{OF}(e', z) \leftrightarrow Wz))$ ⁸

We can spell this out in plain(er) English as in (19).

- (19) 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 (18).

- (20) It is [...] essential to the meaning of [(14)] that the θ -role bound into by the subject not occur within the scope of other quantifiers, as in [(18)], 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 (21), 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.

- (21) $[\exists X: 3(X) \wedge \forall x(Xx \rightarrow Gx)] [\text{every } y: Qy] [\exists Z: 2(Z) \wedge \forall z(Zz \rightarrow Pz)]$
 $\exists e \text{ teach}(X, y, Z, e)$ (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 (21),

(i) $\iota Y(\exists y Yy \wedge \forall y(Yy \leftrightarrow \text{cat}(y)))$

⁸Brasoveanu (2010) and Champollion (2010) argue that event variables are not required in this logical form. Although they code the mereology differently, it is not clear that this is an argument against having events in the logical forms, given the existence of many independent arguments for 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.

the difference between (14) and (22) is only a matter of scope. The logical form is given in (23).

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

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

But the meaning of (14) is crucially different in ways that scope does not reflect. In (23), all the NPs related to plural objects occur in the scope of the quantifier over individual objects (*every quarterback*). This is different in (14) since one of these 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. Here I will outline her argument and emphasize, as she does, what one has to buy in order to escape Schein's arguments. Kratzer uses the sentence in (24) and the goal is to derive the logical representation in (25). This logical form is simplified compared to that of Schein, but the simplification does not matter for present purposes.⁹

(24) **Three copy editors caught every mistake (in the manuscript)**

(25) $\exists e \exists x [3 \text{ copy editors}(x) \wedge \text{agent}(x)(e) \wedge \forall y [\text{mistake}(y) \rightarrow \exists e' [e' \leq e \wedge \text{catch}(y)(e')]]]$

Kratzer makes the following assumptions:

- (26) a. Denotations are assigned to bracketed strings of lexical items in a type-driven fashion (Klein and Sag, 1985)
 b. For any string α , $T(\alpha)$ is the denotation of α
 c. Types: e (individuals), s (events or states; eventualities as in Bach (1981)), and t (truth-values)
 d. Composition Principles: Functional Application and Existential Closure (for this example)

With these assumptions in hand, she provides the following derivation:

- (27) a. $T(\text{every mistake}) = \lambda R_{\langle e \langle st \rangle \rangle} \lambda e \forall y [\text{mistake}(y) \rightarrow \exists e' [e' \leq e \wedge R(y)(e')]]$
 b. $T(\text{catch}) = \lambda Q_{\langle \langle e \langle st \rangle \rangle \langle st \rangle \rangle} \lambda x \lambda e [\text{agent}(x)(e) \wedge Q(\text{catch}_{\langle e \langle st \rangle \rangle}(e))]$
 c. $T(\text{catch}(\text{every mistake})) =$
 $\lambda x \lambda e [\text{agent}(x)(e) \wedge T(\text{every mistake})(\text{catch})(e)] =$

⁹Kratzer assumes that plurals are complex individuals, following Link (1983), among others.

$\lambda x \lambda e [\text{agent}(x)(e) \wedge \forall y [\text{mistake}(y) \rightarrow \exists e' [e' \leq e \wedge \text{catch}(y)(e')]]]$

From (a), (b), by Functional Application.

d. $T(\mathbf{3\ copy\ editors}) = \lambda R_{\langle e \langle st \rangle \rangle} \lambda e \exists x [3\ \text{copy\ editors}(x) \wedge R(x)(e)]$

e. $T(\mathbf{3\ copy\ editors\ (catch\ (every\ mistake))}) =$

$T(\mathbf{3\ copy\ editors})(\lambda x \lambda e [\text{agent}(x)(e) \wedge \forall y [\text{mistake}(y) \rightarrow \exists e' [e' \leq e \wedge \text{catch}(y)(e')]]])$

=

$\lambda e \exists x [3\ \text{copy\ editors}(x) \wedge \text{agent}(x)(e) \wedge \forall y [\text{mistake}(y) \rightarrow \exists e' [e' \leq e \wedge \text{catch}(y)(e')]]]$

From (c), (d), by Functional Application.

f. $\exists e \exists x [3\ \text{copy\ editors}(x) \wedge \text{agent}(x)(e) \wedge \forall y [\text{mistake}(y) \rightarrow \exists e' [e' \leq e \wedge \text{catch}(y)(e')]]]$

From (e), by Existential Closure.

This derivation gets us the intended reading, without severing the Agent. Step (b) shows that all the arguments of **catch** are part of the lexical entry. Note, however, the price we have to pay to be able to do this is clear: 1) A complicated semantic type for the direct object position of **catch** is needed, and 2) it's necessary to posit different argument structures for **catch** and 'catch'. 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: She tries to come up with examples that show that thematic separation for Themes is crucially required. Her main example is (28).

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

Kratzer claims that (28) 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 (29) shows.

(29) 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 (30).

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

(30) 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 (30) 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) presents a range of arguments for severing the Theme in Mandarin Chinese and Igbo, and Schein (2003) provides a different argument for severing the Theme.¹⁰ I turn to that now.

Schein's discussion is based on examples like (31).

(31) The cockroaches suffocated each other.

The sentence in (31) 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.

(32) The cockroaches each suffocated the others.

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

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

(35) 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 (36) which has the paraphrase in (37) (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.

(36) $\exists e[\text{the } X : \text{cockroaches}[X]](\text{Agent}[e, X] \ \& \ \text{suffocate}[e] \ \& \ \text{Theme}[e, X] \ \& \ [\iota X : \text{Agent}[e, X]][\text{Each } x : Xx] [\iota e' : \text{Overlaps}[e', e] \ \& \ \text{Agent}[e', x]] [\exists e'' : t(e'') \leq t(e')] [\iota Y : \text{Others}[x, Y] \ \& \ \text{Agent}[e'', Y]] \ \text{Theme}[e', Y])$

(37) '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

¹⁰Schein (2011) provides a different argument. See also Williams (2009) for a general critique of Kratzer's reliance on cumulativity.

discuss reciprocity in detail, but I 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. In the following two sections, I will present further arguments in favor of full thematic separation involving focus and variable adicities.

2.3 Focus and full thematic separation

Herburger (2000), developing ideas of Partee (1992, 1999) presents an argument in favor of full thematic separation which she claims is necessary in order to give an adequate account of focus (see also Kawamura (2007)). Her arguments presuppose that we want the semantics to be of a neo-Davidsonian character. That is, the argument below is not an argument that this is the only adequate analysis of focus.

Consider the focus-neutral sentence in (38) and its logical form in (39).

(38) Milan bought cider.

(39) $\exists e[\text{buying}(e) \ \& \ \text{Agent}(e, \text{Milan}) \ \& \ \text{Theme}(e, \text{cider})]$

If we then put focus on *cider*, we get the following logical form, Herburger argues.¹¹

(40) Milan bought CIDER.

(41) $\exists e[\text{buying}(e) \ \& \ \text{Agent}(e, \text{Milan})] \ \text{Theme}(e, \text{cider})$

In (41), the non-focused part is the restrictor of the existential quantifier whereas the focus element falls within the scope of the quantificational structure. That is, the restrictor is what is presupposed and the scope is what is asserted. If we instead focus either *Milan* or *bought*, we get the logical forms in (43) and (45).

(42) MILAN bought cider.

(43) $\exists e[\text{buying}(e) \ \& \ \text{Theme}(e, \text{cider})] \ \text{Agent}(e, \text{Milan})$

(44) Milan BOUGHT cider.

¹¹I have simplified the logical forms somewhat, since Herburger repeats material both in the restrictor and in the scope. An example is given in (ii) for (i), where $C(e)$ is a context predicate whose value is fixed by the context of utterance.

(i) ROSALIA wrote a poem.

(ii) $[\exists e: C(e) \ \& \ \text{Write}(e) \ \& \ \text{Past}(e) \ \& \ [a \ x: \text{Poem}(x)] \ \text{Theme}(e,x)]$
 $\text{Agent}(e, \text{rosalia}) \ \& \ \text{Write}(e) \ \& \ \text{Past}(e) \ \& \ [a \ x: \text{Poem}(x)] \ \text{Theme}(e,x)$

Here I set this complication aside for ease of exposition.

(45) $\exists e[\text{Agent}(e, \text{Milan}) \ \& \ \text{Theme}(e, \text{cider})] \text{buying}(e)$

These logical forms show that in order to give a neo-Davidsonian analysis of focus, full thematic separation is required. Note that the thematic relation itself has to be outside the presupposed part - it is not sufficient to just place the content of the focused element outside the presupposed part. That is, a logical form like (46) is not sufficient.

(46) $\exists e[\text{buying}(e) \ \& \ \text{Agent}(e, x)] \ x = \text{cider}$

Were (46) to suffice, a Davidsonian version should suffice as well:

(47) $\exists e[\text{buying}(e, \text{Milan } x)] \ x = \text{cider}$

However, since verbs can be focused as well, as shown in (45), we need the thematic arguments to be severed from the verb. Otherwise a more complicated story needs to be told for cases involving verb focus, and we do not get a symmetric account involving argument focus and verb focus.¹²

The next argument concerns the variable adicity that many verbs display.

2.4 Variable verbal adicities

There is a different argument in favor of full thematic separation that comes from Carlson (1984), Parsons (1990), Borer (2005a,b) and Pietroski (2007). But let us first start with a case from Clark and Clark (1979), which involves the verb *to siren*.

(48) The factory horns sired throughout the raid.

(49) The factory horns sired midday and everyone broke for lunch.

(50) The police car sired the Porsche to a stop.

(51) The police car sired up to the accident site.

(52) The police car sired the daylight out of me.

Even if native speakers of English have never heard *siren* used as a verb, they can easily interpret these sentences. The examples show that the new verb can appear with several subcategorization frames where the core meaning seems to be maintained (to produce a siren sound), though the specific meanings are augmented according to the syntactic environment. This strongly suggests that the meaning of *siren* cannot just come from the verb itself, but it depends on the syntactic construction. Such a view fits nicely with a Neo-Davidsonian theory where the verb only has an event argument.

However, there are many other examples. Consider the following ones from Pietroski (2007).

¹²Thanks to an anonymous reviewer for raising this issue.

- (53) White sold the knife to Plum for ten dollars.
- (54) Plum bought the knife from White for ten dollars.
- (55) Plum bought the knife for ten dollars.
- (56) Plum bought the knife.
- (57) Plum bought the knife for Scarlet.
- (58) Plum bought Scarlet the knife for ten dollars.
- (59) White sold Plum on the idea of buying a knife.
- (60) Scarlet's broker recommended buying long and selling short.

These examples show that verbs like *buy* and *sell* can appear in different contexts and with varying adicities. This is not an idiosyncrasy related to these verbs, as Pietroski shows. The verb *kick* seems paradigmatically transitive (61), but there are also examples that undermine that conclusion, as in (62)-(64).

- (61) White kicked the knife.
- (62) White kicked the knife to Plum.
- (63) White kicked Plum the knife.
- (64) The baby kicked (at nothing in particular).

Similarly, it is not common to think that *cook* and *sing* are ditransitive. However, Pietroski points to the following examples in (65)-(67), which demonstrate that these verbs are not just ditransitive.

- (65) Mrs. White cooked an egg, while Colonel Mustard sang.
- (66) White cooked an egg for Mustard, while he sang a lullaby.
- (67) White cooked Mustard an egg, while he sang the baby a lullaby.

It is of course a theoretical possibility that *sang*, *cook* and *kick* are ternary predicates and that there are covert arguments in cases like (61) and (65). In other cases, it is quite plausible to assume covert arguments, as in (68)-(69).

- (68) John ate.
- (69) Mary played.

Other verbs do not appear to allow direct objects, like *dine*. Still, Pietroski points to examples like (70)-(71) that suggest that the concepts EAT and DINE are equally relational.¹³

- (70) Mustard dined on shrimp.

¹³Here I am following the standard convention of letting small capitals denote concepts.

(71) Mustard ate shrimp in high style.

A further case of discrepancies between grammatical and conceptual adicities concerns the verb *jimmy*. This appears to be a transitive verb.

(72) Alexander jimmied the lock with a screwdriver.

(73) Alexander jimmied the lock.

Here, the reference to an implement cannot appear as a third argument, it has to be in a modifying phrase. Still, the verb *jimmy* presumably indicates a triadic concept that in some way or other has a slot for an implement ‘with which the jimmier jimmies the thing jimmied’ Pietroski (2007, 358). As Pietroski puts it, apparent transitivity does not seem to tell us much about conceptual adicity.

A last example involves the concept of marriage. The following examples show that there is no fixed adicity for this lexical entry either.

(74) Scarlet married Plum, but their marriage was doomed.

(75) Scarlet got married to Plum, with the Reverend Green officiating.

(76) With reservations, Green married Plum and Scarlet.

(77) It was Scarlet’s first marriage, though Plum married for the third time.

Common to this example and the others I have discussed is that on standard assumptions, one can accommodate such facts by stipulating a number of ambiguities in addition to covert arguments. But ambiguities do not explain anything, and is only something one should resort to if there are no other options.

Relevantly, these facts follow if arguments are not arguments of the verb. That is, full thematic separation means that verbs do not have adicities. Of course, as Pietroski points out, it may be that many verbs have ‘canonical’ numbers of arguments, something that probably reflects the adicities of the given *concepts*. However, this is very different from saying that verbs take arguments. On this view, the idiosyncracies that we observe are due to complex interactions between grammatical principles and conceptual knowledge, in addition to language use; cf. Borer (2005a,b).

This is not to say that we do not want to account for cases like in (78)-(79), as Pietroski emphasizes.

(78) *Plum arrived Scarlet.

(79) *Plum sent.

We have seen a number of arguments that lexical items do not have fixed adicities, so if we are convinced by those arguments, we cannot say that these examples are out because these adicities are not fulfilled in the grammar (pace Ramchand (2008, 21-22)). The examples

also do not suggest that predicates can acquire adicities. As Pietroski (2007, 360) argues: ‘This borders on incoherence. One can posit covert arguments, or covert argument-taking elements that combine with lexical item. But I don’t see how a lexical item can have its adicity contingently. A predicate with adicity one is, *ipso facto*, different from any predicate with adicity two (or zero)’. The question is then how we analyze examples such as (78)-(79).

One way to deal with these examples is to follow Pietroski (2007) who argues that examples like (78)-(79) are bad for conceptual reasons.¹⁴ That is, it is not possible to combine the concepts PLUM, ARRIVED and SCARLET or PLUM and SENT. The reasons for this are not explicated in Borer (2005a,b) or Pietroski (2007), presumably because they require a better understanding of concepts than we have at present. Borer and Pietroski are more concerned with arguing that these are not facts that the grammar should account for. Rather, they are facts about language use and about concepts that do not belong to the grammar proper. Unfortunately we do not know a whole lot about how concepts are structured and organized. They could be Fregean in nature, as Fodor (1975, 1987, 2008) argues is the case for the Language of Thought. It could also be that lexical conceptual structures in the sense of Levin and Rappaport Hovav (1995) are part of the Conceptual-Intentional interface. If that is the case, the accounts they offer of data such as (78)-(79) can be carried over in a framework where the status of examples like (78)-(79) are not taken to be grammatical facts.

I am not going to choose one particular way of doing it here, as it is not exactly clear to me what the relevant evidence would look like. Future research will hopefully tell us more about how exactly to analyze the facts on such a view.¹⁵

¹⁴Borer (2005a) seems to argue that there are not really any unacceptable examples of the sort in (78)-(79) because speakers can coerce plausible interpretations out of most structures. Still, she concedes that some examples are more acceptable than others. In the case of *Plum arrived Sarlet* there seems to be an interpretation where ‘Plum helped Scarlet arrive’, but it’s nevertheless the case that one cannot use (78) to utter that thought. So it seems like we need to account for the perceived unacceptability of these data.

¹⁵There might be some examples that do not seem to fit the account I have just offered (thanks to Chris Barker (p.c.) for alerting me to this). Consider the following contrast.

- (i) The doctor amputated John’s leg.
- (ii) *The doctor amputated the leg from John.

For (ii), it does not seem plausible to argue that this is bad because we cannot construe a relevant interpretation. The interpretation is readily accessible, and can be paraphrased as in (i). The sentence does also not seem to be bad for syntactic reasons since Romance inalienable constructions exhibit a syntax comparable to that of (ii). Vergnaud and Zubizarreta (1992) give an analysis of the differences between English and French inalienable constructions that could be implemented here, but since their story is fairly complex and rests on a number of theoretical assumptions within Government and Binding theory, I will not repeat their account here for reasons of space.

Another way to deal with the examples in (78)-(79) is to maintain that there is a grammatical reason why they are bad. Even though I claim that this cannot be because the relevant verbs take a limited number of thematic arguments, there are other grammatical reasons why they are bad (I will return to a possible grammatical reason shortly). This path might be better because of data such as (80)-(81) (see, among many, Levin (1993); Levin and Rappaport Hovav (2005)).

(80) I loaded the truck with hay.

(81) I loaded hay onto the truck.

(82) I loaded the truck.

(83) I loaded the hay.

(84) *I loaded onto the truck.

(85) *I loaded with hay.

Verbs like *load* seem to have a requirement that there be a direct internal argument, i.e., a Theme. This fact does not follow from the structure of the real-world event that is being reported, which is to say that there is arguably a grammatical component to the fact. I am going to suggest that one plausible grammatical component is abstract Case. Following the by now standard assumption that functional heads assign Case (see, among others, Déprez (1989); Mahajan (1989); Chomsky (1991); Johnson (1991)), one can argue that the absence or presence of the relevant Case feature on a functional head determines whether a sentence is licit or not. That is, for a structure like (78), the verb *arrive* does not occur together with the functional head that assigns accusative Case.¹⁶ This means that when we have a structure like (78), the second argument (*Scarlet*) will not receive Case. Similarly, *load* needs to occur with a functional head that assigns accusative Case. For verbs that have variable adicities, this means that the verb can occur with different functional heads. Assuming that indirect objects are licensed by an Applicative head (Marantz, 1993; McGinnis, 2001; Pylkkänen, 2008), this head can optionally be present for verbs like *buy*. I am not going to give specific derivations here for reasons of space, but it seems like a Case-based story is a way to maintain that the data I have discussed here have a grammatical side even though verbs do not take thematic arguments. Lastly, as for (84) and (85), these require an independent explanation. There is a lot of work on the locative alternation in English; see Arad (2006) for a review. Borer (2005a)'s story is compatible with the other assumptions I am making in this paper, so that story could be adopted here. For the

¹⁶An unanswered question on this story is how we ensure that the functional heads occur together with the relevant lexical items or roots. This is a general problem for the view that Case is assigned by functional heads, and I do not have anything new to say about this issue here.

sake of space, I am not going to outline her story here, but it crucially relies on syntax and functional heads.

One should ask the question whether concepts with variable adicities are any less problematic than linguistic predicates with variable adicities.¹⁷ Arguably concepts are prior to linguistic predicates, since many animals seem to have concepts. So if we need concepts and linguistic predicates, concepts need to be acquired in some way or other (see Fodor (2008) for discussion of this, among others). It is not clear that we should expect concepts to be universal, and if they are not, then they have to be acquired by a child. A child will arguably acquire concepts that have various adicities, which is to say that the child has to be sensitive to what kind of adicities concepts have. And then linguists have to ask what the relationship between concepts and linguistic predicates are. They could be isomorphic, or, as the arguments I've reviewed so far indicate, they are not isomorphic and linguistic predicates have a different structure than concepts (see Marantz (1984); Zubizarreta (1987); Pietroski (2008a) for some discussion). However, that does not mean that they do not have some grammatical structure. The Neo-Davidsonian view says that verbs do not have thematic arguments. We need better tests to determine whether the facts above are of a grammatical or a conceptual nature. In order to show that cases like **John arrived Mary* are bad for grammatical reasons, we ought to show that they correlate with other grammatical phenomena (say movement, extraction, binding etc.). As far as I know, it is very hard to come up with such tests, but future work will hopefully help us address these issues.

I have presented two views here as I think they represent the current state of the field when it comes to these issues. The field is in flux and some researchers think that the facts reviewed above suggest that we need to hold on to a view where the arguments of a verb are represented on the verb. Others push the Neo-Davidsonian approach and need to appeal to conceptual knowledge. I have mentioned that it is hard to come up with the relevant tests, but future work will hopefully help us make progress in this domain.

In the next section, I am going to look at some specific counterarguments against full thematic separation. I will mainly focus on the argument based on idiomatic interpretations.

3 Idioms and Themes

In the previous section, we saw arguments in favor of severing all arguments from the verb. One argument in favor of not severing the Theme has not been discussed so far, namely that of idioms. In this section I will discuss idioms and argue that they do not constitute a

¹⁷Thanks to an anonymous reviewer for pushing this question.

strong argument for not severing the Theme.¹⁸

Kratzer (1996) starts out by rephrasing the argument in Marantz (1984) which says that external arguments are not arguments of verbs. Marantz observes that there are many cases where the interpretation of the verb depends on the internal argument. Marantz (1984, 25) gives the following examples.

- (86) a. throw a baseball
- b. throw support behind a candidate
- c. throw a boxing match (i.e., take a dive)
- d. throw a fit
- (87) a. take a book from the shelf
- b. take a bus to New York
- c. take a nap
- d. take an aspirin for a cold
- e. take a letter in shorthand
- (88) a. kill a cockroach
- b. kill a conversation
- c. kill an evening watching T.V.
- d. kill a bottle (i.e., empty it)
- e. kill an audience (i.e., wow them)

One could of course argue that these verbs are homophonous, but that seems like a cop-out and it also seems to miss a generalization that one can make, namely that the verb and its internal argument together determine the relevant interpretation (cf. Marantz (1984, : 25)). Furthermore, Marantz (1984, 26): notes that ‘... the choice of subject for the verbs does not determine the semantic role of their objects’. This is supported by the data in (89)-(90).

- (89) a. The policeman threw NP.
- b. The boxer threw NP.

¹⁸Another potential argument for not severing the Theme comes from Tenny (1994)’s observation that only the Theme can be measured out, where ‘measuring out’ entails that the direct argument plays a particular role in delimiting the event. However, as Borer (2005a) shows, Tenny’s observation can be recast in syntactic terms by letting a particular syntactic position encode the property of measuring out. Therefore I do not see that Tenny’s observation constitutes an argument for not severing the Theme. As Tenny also points out, there are constraints on all arguments: ‘Constraints on the aspectual properties associated with direct internal arguments, indirect internal arguments, and external arguments in syntactic structure constrains the kinds of event participants that can occupy these positions’ (Tenny, 1994, 2).

- c. The social director threw NP.
 - d. Throw NP!
- (90)
- a. Everyone is always killing NP.
 - b. The drunk refused to kill NP.
 - c. Silence can certainly kill NP.
 - d. Cars kill NP.

These facts would all follow if external arguments are not true arguments of their verbs, Marantz argues. Bresnan (1982) and Grimshaw (1990) take issue with this claim. Their counterarguments are given in (91) and (92).

- (91) In short, one could capture the subject/non-subject generalization without affecting the lexical representation of predicate argument structure, simply by giving the subject a distinguished role as final argument in the semantic composition of the sentence (Bresnan, 1982, 350).
- (92) In any theta-marking calculation, the external argument is the last to enter in. Thus, in effect, calculations performed over the internal arguments are done without reference to the external arguments, but any a-structure calculation involving the external argument will of necessity involve the internal ones. The special properties of externals follow from their occupying the position of maximal prominence (Grimshaw, 1990, 35).

The problem with this reasoning is that it does not ensure that the external argument does not trigger a special interpretation of the verb. There is no technical obstacle to formulating such a rule, as Kratzer (1996, 115) notes. She gives the examples in (93) (Kratzer, 1996, 115), where the highest argument triggers a specific interpretation of the verb.

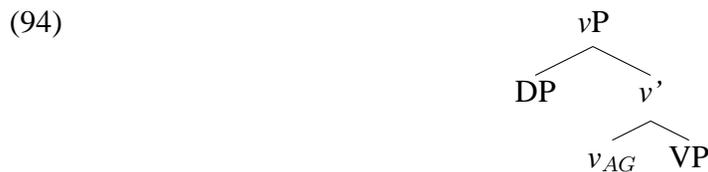
- (93)
- a. If *b* is a time interval, then $f(a)(b) = \text{truth}$ iff *a* exists during *b*.
 - b. If *b* is a place, then $f(a)(b) = \text{truth}$ iff *a* is located at *b*
 - c. If *b* is a person, then $f(a)(b) = \text{truth}$ iff *b* is the legal owner of *a*.

Kratzer takes issue with the position stated by Bresnan and Grimshaw. Although Bresnan and Grimshaw are probably right that you do not need severed external arguments to get an asymmetry between external and internal arguments, Kratzer's point is that we get a better theory if we sever the subject. She uses the Marantz data to develop a specific syntactic and semantic theory where the Agent, but not the Theme, is severed from the verb.

Note, however, that Kratzer's argument only goes through if the specification of the verb's meaning only refers to the internal argument, and furthermore, if idiomatic dependencies like these can be captured by defining the meaning of the verb. Kratzer discusses

the first premise but not the second. She seems to assume that idiomatic dependencies must be specified over objects in the lexicon, that is, over the verb and its Theme. However, we will see below that Marantz (1997) has a different view (see also Harley (2009)), namely that idiomatic dependencies can be defined over outputs of syntax, which case Kratzer’s argument would not go through.

Recall that for Kratzer, idiomatic dependencies are stated over function-argument relations in a single lexical item, i.e., the verb. Marantz (1997, 208) has a very different view as he argues that ‘The syntactic head that projects agents defines a locality domain for special meanings. Nothing above [v_{AG}] can serve as the context for the special meaning of any root below this head, and vice versa’.¹⁹ The quote refers to the structure in (94).²⁰



Marantz (1997, : 208-209) points out that this view makes three predictions. They are listed in (95)-(97).

- (95) No idioms with fixed agents (root in agent position, context for special meaning within VP).
- (96) No eventive-passive idioms, but possible non-eventive stative idioms.
- (97) No idioms with causative morpheme and lower agentive verb, but possible idioms with causative and lower non-agentive verb.

The first prediction is a slightly more refined version of Marantz (1984), which I have discussed above. The prediction is borne out, Marantz argues, and points towards examples such as (98), where the idiom is non-agentive.²¹

- (98) The shit hit the fan.

This is the only point where Kratzer and Marantz agree. The two other predictions are predictions that Kratzer cannot make in her system, so to the extent that these predictions are borne out, Kratzer cannot capture them.

¹⁹See also Harley (2009) and Bowers (2010) for a somewhat similar view of idiomatic dependencies.

²⁰There has recently been a lot of discussion on how to capture ‘special meanings’ within Distributed Morphology. I will not review the debate here, but see Arad (2003); Marantz (2001); Harley (2009); Borer (2009); Embick (2010) for different perspectives.

²¹Similar examples are provided by O’Grady (1998, 298) and Bruening (2010, 535), putting forward data such as *fortune smiled on X*, *the ceiling caved in on X*, *the bottom fell out on X*, *time’s up for X*. As Bruening points out, some of these might be unaccusative, but *smile on* is probably not, he claims.

The second prediction is borne out, which we can see by considering the differences between ‘adjectival (stative) passives’ and ‘syntactic (eventive) passives’. The former are created with a functional head merging below the ν head that projects the agent, while the latter are formed with a functional head merging above or as the head that projects Agents. Marantz points towards data from French and Chichewa that show this. Here I will look at the Chichewa data, which Marantz (1997, 210) cites from Dubinsky and Simango (1996). Note that this language has different suffixes for passives and statives.

- (99) Chimanga chi-ku-gul-idwa ku-msika.
 corn AGR-PROG-buy-PASS at-market
 ‘Corn is being bought at the market.’ [no idiomatic reading, and none possible with passives]
- (100) Chimanga chi-ku-gul-ika ku-msika.
 corn AGR-PROG-buy-STAT at-market
 ‘Corn is cheap at the market.’ [idiomatic reading of *buy* in the context of STAT]
- (101) Chaka chatha chimanga chi-na-lim-idwa.
 year last corn AGR-PROG-cultivate-PASS
 ‘Last year corn was cultivated.’
- (102) Chaka chatha chimanga chi-na-lim-ika.
 year last corn AGR-PROG-cultivate-STAT
 ‘Last year corn was beautiful.’

Only statives can have idioms; passives cannot. Kratzer’s approach cannot capture this because on her approach, it should not matter whether the arguments that verbs take are active or stative.

Let us now look at the last prediction, (97). Building on Ruwet (1991), Marantz notes that a causative construction in English may not be idiomatic unless the lower predicate is non-agentive. This is illustrated in (103)-(106).

- (103) Make oneself scarce.
 (104) Make X over.
 (105) Make ends meet.
 (106) *Make X swim/fly a kite

The examples in (103)-(105) are all non-agentive whereas the example in (106) is agentive and consequently does not have an idiomatic reading.²²

²²The system Marantz argues in favor of makes a prediction. Alexander Williams (p.c.) observes that Marantz would allow anything within VP to trigger a special interpretation. If there are low adjuncts in

Lastly, there are verbs that can take part in multiple idiom patterns. Bruening (2010, 536) gives the following examples for *give*.

(108) give X the creeps

(109) give rise to X

If the idiomatic interpretation is specified on verbs, two lexical specifications for *give* seem to be necessary; one for each idiom structure. If one is in for polysemy, that is a possible analysis, but as I have argued above, we should resist this, cf. Borer (2005a,b); Boeckx (2010). Bruening also argues that we need a theory of idiom formation that explains the lack of logically possible idioms such as (110), where the asterisk means that an idiomatic interpretation is missing.

(110) *give the wolves X

I will not attempt to develop such a theory here; the goal is to show that Kratzer's theory is inadequate to account for the complexities of idiomatic dependencies. See Bruening (2010) for one attempt at developing a comprehensive theory of idioms.

All these arguments suggest that Kratzer's argument from idioms does not carry much force. It should be clear that idioms are difficult and hard to interpret, but to the extent that they tell us something, they do not seem to provide an argument for not severing the Theme.

4 Challenges for the syntax-semantics interface

In this paper I have presented several arguments in favor of abandoning the traditional assumption that verbs take arguments. I have addressed counter-arguments and tried to show that they are not very strong. The resulting picture is one in which verbs do not take thematic arguments and where LFs have a Neo-Davidsonian structure. If this view can

VP, they could therefore do that. Here is a hypothetical example that Williams provides, assuming that the adjunct is VP-internal.

(107) I **polished my china** with Bill **in the toolshed**.

'I wasted time doing something in a counterproductive manner with Bill yesterday.'

This example illustrated a hypothetical case where the bolded part of the sentence is an idiom. Since such examples are not idiomatic, there is a potential problem for Marantz' theory. However, it is unclear what the status of adjuncts are and whether they are actually 'low' enough for the prediction to go through. I will leave this matter unsettled for the purposes of this paper.

be upheld, it raises a number of serious challenges for the syntax-semantics interface.²³ 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.

Borer (2005a,b) has argued extensively against polysemy through lexical specifications ('endoskeletal' approaches) and in favor of structural constraints on different meanings ('exoskeletal' approaches).²⁴ It is basically the issue of whether the verb is a full sentence in disguise or not. Borer points out that there is a long tradition in the syntactic literature to assume that properties of lexical items can help account for syntactic restrictions, that is, the verb really is a full sentence in disguise. Especially since Grimshaw (1979) and Pesetsky (1982), the lexicon has been really important. This culminated in the Theta Criterion, which says that 'Each argument bears one and only one theta-role, and each theta-role is assigned to one and only one argument' (Chomsky, 1981, 36). Borer notes, though, that the importance of lexical information is not specific to Chomskyan generative grammar but to most generative approaches (Borer, 2005a, 4). However, as Borer argues extensively, it is redundant to encode lexical properties both in the syntax and on the lexical items themselves. Why should the syntax recode the lexical information? Ultimately this is a question of why we need syntax at all if all syntax does is recode lexical information.

Borer suggests that we dispense with the lexical information and that the syntactic structure is the sine qua non when it comes to interpretation. She proposes a fundamental dividing line between substantive and functional vocabulary. Here is a quote relevant for this paper:

I believe that the proposed dividing line is a real one, and that it distinguishes between what is grammatically real - structures and formal properties of functional items, and what may be very real, but not grammatically so - properties of substantive vocabulary. The latter, I propose, are creatures born of perception and conceptualization, representing an intricate web of layers upon layers of a complex perceptual structure and emerging world knowledge, concepts which come to represent it, the reflection upon these concepts, and so on. Their properties, however characterized, are thus fundamentally not grammatical (Borer, 2005a, 10-11).

This quote makes it clear that structural aspects are more important than lexical aspects

²³See Krifka (1992) for a 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.

²⁴See also Boeckx (2010) for a range of arguments in favor of defeating what he calls 'lexicocentrism'.

of individual words (cf. van Hout (1992, 1996); Schein (1993, 2003, 2011); Gómeshi and Massam (1994); Tenny (1994); Harley (1995); Kratzer (1996); Marantz (1997); Ritter and Rosen (1996, 1998); Borer (2005a,b); Cuervo (2010); Travis (2010); Boeckx (2010) for similar conclusions). What we want to know then is what kind of structural aspects are relevant.

As Borer (2005a, 22) points out, the close match between the structural positions of complement and specifiers and their interpretation gave rise to the research program that attempts to reduce syntactic complementation (C-selection) to semantic complementation (S-selection) (Grimshaw, 1979; Pesetsky, 1982). But this program becomes less straightforward to implement once the functional domain is considered. In this domain, there is no direct relation between specifiers and subjects on the one hand and complements and objects on the other hand. Just think of a nominative subject that is in the specifier of a special functional projection. As Borer argues, this specifier is clearly not the subject of that functional projection (Borer, 2005a, 22). So, ‘Notions such as head, specifier, and complement, developed in the context of lexical projection and argument structure, carry no intuitive force when transferred over to functional projections’ (Borer, 2005a, 24), a point that van Riemsdijk (1998) also makes in a different context.²⁵ In fact, as Borer (2005a, 27) points out, little goes wrong if there is no significant grammatical distinction between specifiers and complements.²⁶ If this is true, then this is important for how we think about the mapping from syntactic representations to logical forms.

Borer stresses the importance of functional structure for interpretation. Based on the arguments above, the natural conclusion to draw is that functional structure is important for how arguments are interpreted, since the verb itself does not impose grammatical restrictions. An example of this is the significant literature on the functional element that introduces Agents, cf. Chomsky (1995); Harley (1995); Kratzer (1996); Alexiadou et al. (2006); Folli and Harley (2007); Pyllkkänen (2008); Ramchand (2008); Sailor and 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. Of course, Neo-Davidsonian logical forms that encompass full thematic separation 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) and Pietroski (2005, 2008b, 2011).

There is an outstanding question, though, namely what the nature of the syntactic representations are such that we can develop a mapping algorithm from those representations

²⁵In Mirror Theory, as in Brody (2000), notions like specifiers and complements are mostly important for linearization and word order and they do not play a special role for interpretation.

²⁶This argument is pursued at great length in Lohndal (ress), where it is shown that there has never been much evidence for distinguishing specifiers from complements.

onto logical forms. Since the starting assumption is that these logical forms should consist of conjuncts, it seems plausible to look for a syntax and a mapping that together will yield such logical forms. Lohndal (in progress) entertains the hypothesis that each application of Spell-Out corresponds to a conjunct at logical form. Put differently, at each point where a chunk of syntactic structure is transferred to the interfaces, that chunk constitutes a conjunct. That would yield a fairly transparent mapping from the syntactic representations to the logical forms. Of course, the question now is how to construe a syntax that achieves this.

I am not going to develop such a syntax in this paper. Lohndal (in progress) gives a very specific implementation of how this can be done by elaborating the proposal I just mentioned. What I want to be very clear on here are the consequences of the arguments we have considered above. If the arguments for full thematic separation and Neo-Davidsonian logical forms can be sustained, then that raises important challenges both when it comes to accounting for unacceptable examples and for the mapping from syntactic structures onto these logical forms.

5 Conclusion

The goal of this paper was to present a host of arguments against the widespread assumption that verbs take thematic arguments. The arguments have been drawn from facts about distributive readings, focus, and variable verbal adicity. A number of counter-arguments have also been addressed and I have argued that these arguments do not undermine the argument in favor of severing thematic arguments from the verb. I have also discussed possible consequences of this view for the syntax-semantics interface and argued that the mapping should rely on the functional structure of the sentence.

The most important take-home message from the present paper is that there are several arguments against the widespread assumption that verbs have argument structure that is reflected in the grammar. If the arguments given in this paper are correct, then verbs might simply be monadic for the purposes of the grammar. That has a range of consequences that future work has to deal with, concerning the relationship between monadic predicates and their (possibly) polyadic concepts, the character of the syntax-semantics interface and the nature of semantic composition.

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