

Chapter 3

Theme Arguments

3.1 Cumulativity

If arguments of verbs are introduced by secondary predicates denoting general thematic relations like the agent relation or the theme relation, we may wonder whether those relations have any conceptual significance beyond their role in argument association. The answer is a clear ‘yes’ for the agent relation, but an equally clear ‘no’ for the ‘theme’ or ‘object’ relation. The concept of an agent of an action is vague, but is well understood and the subject of numerous papers and books in philosophy and legal reasoning, none of them interested in argument structure. The concept of a ‘theme’ or ‘object’ of an event, on the other hand, has not generated much interest outside of lexical semantics. Parsons 1990 observes that “the use of Theme (“Patient”) is often called the “left-over” case, since so little can be said about it in general...”¹. To say the least, then, the agent relation is a more contentful and more interesting concept than the theme relation. Why should that be so? Is there something wrong with the putative theme relation?

There is a formal property that brings out a conceptual asymmetry between agents and so-called ‘themes’ of events. The property is called ‘cumulativity’ in Krifka 1992 and 1998 and ‘summativity’ in Krifka’s earlier work². Krifka

1. Parsons 1990, 74.

2. See Krifka 1986 and 1987.

assumes cumulativity to be a property shared by all thematic relations. However, cumulativity can only be a property of all thematic relations if the putative theme relation is not taken to be a thematic relation in a technical sense, that is, a relation denoted by a predicate that introduces all theme arguments of verbs in a neo-Davidsonian way.

Before looking at the role cumulativity may play for theories of verb meaning, let me first illustrate what it is. Imagine a young man, Alan, who wants to plant a rose bush in his mother's yard. He picks a sunny spot, removes the sod, digs a hole, and drives off to the garden center. It so happens that unbeknownst to Alan, his brother Brian has the same idea at about the same time. Unlike Alan, however, Brian drives to the garden center first. He buys a rose bush, drives to his mother's house, and discovers the hole in the ground that has just been dug by his brother. He loosens the bottom soil, places the bush in the hole, and walks away. Along comes Campbell, the gardener, who adds manure, leaf mold, and compost. Campbell's back hurts, so he goes home without finishing the job. Neighbor Dunn happens to see what still needs to be done and covers the roots of the rose bush with subsoil and topsoil. The bush is planted. Who did it?

I think it's fair to say that the four men together planted the rose bush. The action of planting is the sum of all the individual actions: Removing the sod, digging a hole, loosening the bottom soil, placing the bush in the hole, adding manure, leaf mold, and compost, and shoveling subsoil and topsoil into the hole. The agent of the rose bush planting is a plural individual consisting of Alan, Brian, Campbell, and Dunn. That plural individual is the sum of the agents of all the constituent actions.

The rose bush example illustrates the cumulativeness of the agent relation. Formally, this kind of cumulativeness is a property of relations between individuals and events, and is defined as follows ('+' stands for the mereological sum operation)³:

- (1) Cumulativeness (relations between individuals and events)

$$\Box_{\langle e, \langle s, t \rangle \rangle} \Box e \Box e' \Box x \Box y [[R(x)(e) \ \& \ R(y)(e')] \ \Box \ R(x+y)(e+e')]$$

The agent relation is a relation between individuals and events, hence is the kind of relation that can fall under definition (1). And it seems to have the property required in (1): whenever x is the agent of event e , and y is the agent of event e' , then the sum of x and y is the agent of the sum of e and e' .

But wait. It looks like there is an important class of exceptions. Suppose the teacher made the student leave. In this case we have an event e of making the student leave, and an event e' of leaving. The agent of e is the teacher and the agent of e' is the student. Assuming cumulativeness of the agent relation, the agent of $e+e'$ should be the sum of the student and the teacher. But isn't e' a part of e , and therefore $e+e' = e$? The sum of the teacher and the student should then also be the agent of e . I think that something rather subtle has gone wrong in the piece of reasoning I just presented. Following Ginet 1990, we should distinguish between events of causing the student to leave and events that cause the student to leave. An event of causing the student to leave is the sum of all the events in some causal chain that has the student's leaving as a final link. An event that causes the student to leave, then, is an event that includes the student's leaving. On the other hand, an event that causes the student to leave is the initial link of some causal chain

³. Krifka 1986, 1987, 1992.

whose final link is the student's leaving. Such an event, then, does not include the student's leaving. If periphrastic causative constructions like **make the student leave** describe events that cause the student to leave, rather than events of causing the student to leave, those causatives do not falsify the claim that the agent relation is cumulative. In our example, the teacher would be the agent of an event e that causes e' , the event of the student's leaving. But now e' is not assumed to be part of e anymore, and consequently, e is no longer identical to $e+e'$. I conclude that periphrastic causative constructions are compatible with the cumulativeness of the agent relation. I will have more to say about causatives in chapter 7. For now, let us move on with the current plot.

Unlike the agent relation, the putative theme relation does not seem cumulative. When Alan removes the sod, the theme of that event is the sod, but when he digs a hole, the theme is the hole. Or is it the soil that is being removed when the hole is dug? Skipping over that last complication, the rose bush is the theme when placed in the hole, and the manure, the leaf mold, the compost, the bottom soil, subsoil and topsoil are the themes of relevant subevents. Assuming that the whole planting event is indeed the sum of all the subevents I mentioned, cumulativeness would require that the sum of the rose bush plus the sod, the hole, the manure, the leaf mold, the compost, and the various portions of soil is the theme of the planting, rather than the rose bush alone. Unlike the agents of actions, then, the themes of actions do not get summed up when the actions are. Themes lack the conceptual independence of agents. Theme arguments seem to be tightly linked to their verbs. Agents are different. Actions seem to have agents independently of how we describe them.

We have seen that the putative theme (or object) relation is not cumulative. On the other hand, the agent relation looks like a good candidate for a cumulative relation. Let us now explore what other relations are cumulative. Take the relation that holds between an event e and an individual x just in case e is an event of planting x . This relation is cumulative if (2) holds:

$$(2) \quad \Box e \Box e' \Box x \Box y [[\text{plant}(x)(e) \ \& \ \text{plant}(y)(e')] \Box \text{plant}(x+y)(e+e')]$$

(2) does seem to be true. If e is an event of planting those roses and e' is an event of planting those lilies, for example, then $e+e'$ is an event of planting those roses and those lilies. We talk about such complex planting events when we say that planting those roses and those lilies must have taken a long time. Or when we complain that the planting of those roses and those lilies was a real strain on the town budget. Other transitive verbs behave in a similar way. If e is an event of constructing those roads, and e' is an event of constructing those bridges, then $e+e'$ is an event of constructing those roads and those bridges, for example. And if e is an event of destroying those barns, and e' is an event of destroying those sheds, then $e+e'$ is an event of destroying those barns and those sheds, and so on.

There is a difficulty with what I just said. I sometimes feel I should have used the plural 'events' instead of the singular noun 'event'. For example: If e is an event of destroying those barns, and e' is an event of destroying those sheds, then $e+e'$ are events of destroying those barns and those sheds. Once we start thinking about this issue, more questions pop up. If more than one barn was destroyed, why can we still talk about 'the destruction of those barns'? Why don't we have to use the plural 'destructions'? In contrast, why does my use of 'the father of those children' imply that there is just one father that is being talked about, hence those children must be siblings? Those

questions are important, but I don't think I have to go into them here. The individuation of events is notoriously vague and context dependent, and it is often not clear whether particular events are singular or plural in any absolute sense. This is bound to lead to insecurities with number marking on event nouns. While verbs are number marked as well, their number marking (if meaningful at all) does not seem to relate to the singularity or plurality of the events they describe. The problem I have been experiencing, then, is a problem created by my English metalanguage. Using the count noun 'event' to describe the events picked out by verbs forced me to make number distinctions that are not imposed by the verbs themselves. To avoid the problem, I could have coined an artificial number-neutral mass term like 'eventure'. I chose not to, but had to add a word of caution.

The generalizations suggested by our discussion so far can be summarized as follows:

- (3) a. The agent relation is cumulative.
- b. The putative theme relation is not cumulative.
- c. Specific thematic relations like the one holding between a planting event and what is planted, a construction event and what is constructed, a destruction event and what is destroyed and so on, are all cumulative.

If agent arguments are, but theme arguments are not true arguments of their verbs, the specific thematic relations mentioned in 3(c) are simply the denotations of the predicates 'plant', 'construct', and 'destroy' respectively, and (3) can be restated as (4):

- (4) a. The agent relation is cumulative.
- b. The putative theme relation is not cumulative.
- c. Verb denotations that are relations between individuals and events are cumulative.

If theme arguments are not neo-Davidsonian even at logical-conceptual structure, there is no thematic role predicate ‘theme’, and the theme relation has no status as a cognitively significant relation. The theme relation may not qualify as a ‘natural’ category at all. What are natural categories? Any theory of lexical acquisition must make some distinction between categories that are natural and those that are not. Very roughly, the natural categories are those that humans take to be candidates for denotations of simple lexical items, spontaneously and without any explicit instruction or definition. The most famous example of a non-natural category is the property ‘grue’ discussed by Nelson Goodman in the fifties⁴. An object is grue if it is green and has been examined before a fixed time, say December 31, 2010, or else it is blue, and has not been examined before December 31, 2010. All emeralds that have been examined so far are grue as well as green. But for some reason - and this is Goodman’s puzzle - grueness, unlike greenness, is not a category that humans come up with naturally when presented with emeralds, grass, or frogs, for example. To be sure, the concept of grueness can be grasped by human minds, but if it is, it’s on the basis of a verbal definition. The theme relation may not be quite as gruesome as grueness, but unlike the agent relation, it may still not qualify as a natural relation. If it doesn’t, it is not a candidate for the denotation of a thematic role predicate at logical-conceptual structure. If there is neo-Davidsonian association in logical-

⁴. Goodman 1954.

conceptual structure, a child acquiring the meaning of verbs must come up with the necessary thematic role predicates without definition or explicit instruction. The denotations of those relations, then, must be natural. Excluding the theme relation, but not the agent relation from the set of natural relations, we can state a constraint that might very well apply to all relations between individuals and events:

$$(5) \quad \Box e \Box e' \Box x \Box y \Box R_{\langle e \langle st \rangle \rangle} [[\text{natural}_{\langle e \langle st \rangle \rangle t} (R) \ \& \ R(x)(e) \ \& \ R(y)(e')] \\ \Box R(x+y)(e+e')]]$$

Constraints like (5) are humble contributions to a theory of semantic acquisition. They cut down the candidate set for the denotations of lexical items a language learning child might have to consider.

Suppose what I just said is all wrong, and the theme relation is a natural relation after all⁵. If both agent and theme arguments were neo-Davidsonian at logical-conceptual structure, the counterparts of ordinary transitive verbs would merely denote properties of events. But there would still be the fact that the relation between the events described by verbs and the individuals denoted by their theme arguments is constrained by cumulativity, and this generalization would have to be captured. We would have to do this using the two postulates in (6), or some such set of statements:

$$(6) \quad \text{a.} \quad \Box e \Box e' \Box x \Box y [[\text{agent}(x)(e) \ \& \ \text{agent}(y)(e')] \Box \text{agent}(x+y)(e+e')] \\ \text{b.} \quad \Box e \Box e' \Box x \Box y \Box P_{\langle st \rangle} [[\text{natural}_{\langle st \rangle t} (P) \ \& \ P(e) \ \& \ P(e') \ \& \ \text{theme}(x)(e) \\ \ \& \ \text{theme}(y)(e')] \Box P(e+e') \ \& \ \text{theme}(x+y)(e+e')]]$$

⁵. “The notion of Theme may be one that comes naturally to human language learners, since we have an intuitive understanding of it...”. Parsons 1990, 81.

(6) lacks the simplicity and elegance of (5). (5) captures the cumulativity constraint through a constraint on a whole semantic domain. (6) needs two conditions to account for the same constraint, including particular stipulations for the predicates ‘agent’ and ‘theme’. The clumsiness of (6) may be a pointer to a misguided conceptualization of the domain of investigation. If we don’t make the right theoretical choices, we often end up with odd generalizations.

If the theme relation is not natural, theme arguments of verbs cannot be introduced by a secondary predicate denoting the theme relation, since the meaning of such a predicate would have to be learned without instructions or definitions. Theme arguments could still be introduced by less general secondary predicates, however. Such secondary predicates might denote the more specialized thematic relations discussed in Krifka 1987: gradual effected patient (‘write a letter’), gradual consumed patient (‘eat an apple’), gradual patient (‘read a letter’), affected patient (‘touch a cat’), or stimulus (‘see a horse’)⁶. As soon as there is a choice of thematic relations that can introduce direct objects, the question whether each and every kind of direct object can be matched up with one of those relations pops up. The search for thematic relations suitable for introducing direct objects of all kinds has been unsuccessful so far, in spite of many attempts documented in the literature. Commenting on that lack of success, Levin 1999 lists the direct objects in (7) and (8) as hard to classify in terms of commonly used thematic role inventories:

6. See also Ramchand 1997, who argues for some additional object relations.

- (7)
- a. **The engineer praised the bridge.**
 - b. **The engineer touched the bridge.**
 - c. **The engineer avoided the bridge.**
 - d. **The engineer owned the bridge.**
 - e. **The engineer imagined the bridge.**
 - f. **The engineer studied the bridge.**
- (8)
- a. **The engineer ignored the architect.**
 - b. **The engineer praised the architect.**
 - c. **The engineer greeted the architect.**
 - d. **The engineer selected the architect.**
 - e. **The engineer supervised the architect.**
 - f. **The engineer fought the architect.**
 - g. **The engineer met the architect.**
 - h. **The engineer visited the architect.**
 - i. **The engineer followed the architect.**

Even worse, among the object relations listed by Krifka, the affected object relation is not cumulative. For example, when the rose bush was planted in our earlier example, it was presumably an affected patient of the planting event. That event in turn was the sum of events with affected patients of their own: the sod, the different layers of soil that were removed and shoveled back, the manure, the leaf mold, the compost, and then again the rose bush. Summing up the affected patients of those subevents doesn't give us the rose bush. The concept of an 'affected patient', then, fares no better than the general 'theme' concept, as far as cumulativity is concerned. Events do not seem to have affected patients independently of the way they are described. Unfortunately, the affected patient relation would have to be posited for a

very large class of transitive verbs on Krifka's proposal, presumably including all of the following, which seem to have affected objects:

- (9) **Abduct, absorb, adjust, affect, amputate, arrest, attach, banish, buy, chase, check, clasp, clench, decorate, deport, dump, edit, educate, execute, feed, fix, grab, grasp, greet, harm, hurt, ignite, immerse, jar, jostle, jumble, kidnap, kill, label, loot, mail, maim, neglect, nip, occupy, operate, paralyze, pare, quench, record, recycle, slay, slice, sprain, squash, thrust, usher, veil, vend, wag, wreck,**

There are good reasons, then, for being skeptical about the viability of neo-Davidsonian association for each and every kind of direct object. It is important, however, to keep in mind that so far, we haven't seen any arguments that would rule out the possibility that at least some direct objects are introduced by secondary predicates, either at logical-conceptual structure alone, or both at logical-conceptual structure and in the syntax. The skepticism I expressed concerned the assumption that all direct objects are uniformly introduced by secondary predicates, and was also directed against particular secondary predicates – those expressing non-cumulative relations like the general theme or the affected object relation. I certainly do not want to deny that transitive predicates can be constructed syntactically and that direct objects can be introduced by secondary predicates, including adjectives, adverbs, particles, and other verbs, as in a serial verb construction. I will explore the syntactic construction of transitivity in chapter 7.

3.2 The lexical representation of theme arguments

If a secondary predicate is to be usable for the neo-Davidsonian introduction of theme arguments in the syntax, it must have a denotation of its own and has to participate in the semantic composition process in a predictable way. If it is unpronounced, it has to have a recoverable meaning and satisfy whatever general constraints on unpronounced heads there may be. It's hard to see how all transitive verbs in, say, a language like English could be syntactically decomposed into primary predicates expressing properties of events and secondary predicates responsible for the neo-Davidsonian introduction of direct objects. If there isn't a single all-purpose thematic relation 'theme', how could primary predicates select the thematic relations that are right for them?

Take the English verb **construct** and suppose it is a mere predicate of events. It would then denote the function $\lambda e \text{ construct}(e)$. It would describe construction events, that is. How would we know that **construct** takes direct objects that denote the creations of the construction activity? Construction creates things, hence we expect effected patients. But construction also affects materials like boards or bricks, and the environment like the plot a house is built on. Why, then, don't we get affected patients with **construct**? Finally, construction work consumes time and money, and might destroy good views and open farmland, so we should find consumed patients with **construct**, too. But we don't. Among the three possibilities illustrated in 10(a) to (c), only 10(a) is realized.

- (10) a. **construct this barn** (effected patient)
 b. * **construct those plots** (affected patient)
 c. * **construct my yearly income** (consumed patient)

The Latinate verb **construct** has a native cousin **build**. **Construct** and **build** are (near) homonyms. Like **construct**, **build** only tolerates direct objects that denote effected patients:

- (11) a. **build this barn** (effected patient)
 b. * **build those plots** (affected patient)
 c. * **build my yearly income** (consumed patient)

Since **build** can be intransitive, it must be possible for it to be a mere predicate of events. Consequently, the denotation of **bauen** should be λe build(e), a property of events. When used transitively, **bauen**, like **build**, takes objects denoting what is being built. The alternation between transitive and intransitive **build** is a very productive one. It shows up with many verbs in English:

- (12) **Bake, build, braid, brew, burn (a CD), carve, cast (a statue), chirp, cook, crochet, dig (a hole), draw, drill, fold (a paper crane), hum, knit, mumble (a few words), murmur, paint, sing, shoot (a movie), sketch, weave, whisper, whistle, write...**

In her 1996 dissertation about transitive/intransitive verb alternations, Angeliek van Hout observed that when verbs like those listed in (12) are used transitively they are causatives. They would then be concealed causatives in the sense of Bittner 1999. The interesting consequence is that sentences like 13(a) emerge as resultative constructions very much like the one illustrated in 13(b):

- (13) a. **Nelly drilled a hole.**
b. **Nelly drilled herself deaf.**

In 13(a), we are talking about an event of causing a state that consists in the existence of a hole and is a drilling activity. In 13(b), the drilling is also claimed to be an event of causing a state - Nelly's deafness. I will discuss resultatives in more detail chapter 7. For now, it should be sufficient to see that we do not necessarily have to assume that there are both transitive and intransitive versions of verbs like **build**. We can start out with the intransitive alternant, and construct the transitive alternant in the syntax using whatever composition process is at work in 13(b). The only adjustment needed is that we have to shift the property of being a hole into the property of being a state consisting in the existence of a hole, hopefully an independently motivated move. The prediction is that as far as the syntax is concerned, any intransitive verb should be able to appear in the construction illustrated by 13(a), and the only limits should be set by the semantics. Not every intransitive verb describes an activity that can be readily understood as creating things. But with a little imagination, suitable scenarios can be found even for activities like sneezing holes into a wheel of cheese.

So far so good, but what is now the status of the verb **construct**, a verb that also describes building activities, but is obligatorily transitive, with an object that also picks out the things that are being built? What does that verb look like when it enters a syntactic derivation? What is it that guarantees its transitivity? In recent work (Borer forthcoming), Hagit Borer explores the interesting idea that all transitivity is syntactically constructed. More generally, I understand the claim as implying that in, say, sentences like 13(b), the conceptual system provides nothing but the concept 'Nelly' for the

root **NELLY**, the concept ‘drill’ for the root **DRILL**, and the concept ‘deaf’ for the root **DEAF**. All other components that contribute to the meaning of 13(b) are provided by the functional structure of the sentence. Highly relevant for our current discussion is that according to Borer, the conceptual system does not provide any argument structure for lexical (substantive, as opposed to functional) items. Let’s start to spell out the proposal to see what the consequences are. We could think of the root **DEAF**, for example, as naming a kind, where in this particular case, the kind would have to be a kind of eventuality, rather than a kind of individual. If **DEAF** is a name for a kind, it doesn’t have arguments. Names never do. It would then be the job of functional structure, hence the syntax proper, to map names for kinds into predicates with arguments. A name for an event kind, for example, could be mapped into a property of events in a first step, and then into a relation between individuals and events as the derivation proceeds. This is a very radical proposal that implies that all relational concepts are the product of syntactic derivation. It is syntax that gives us relational concepts. If a relational concept doesn’t directly correspond to a basic functional category, it would have to be syntactically constructed with the help of such a category.

How realistic is Borer’s proposal? It runs into a first class of problems with irreducibly relational concepts. Take spatial concepts like ‘farness’ or ‘closeness’. There just can’t possibly be kinds of states consisting in mere closeness or farness. Closeness is always ‘closeness to’, and farness is always ‘farness from’. True, we use prepositions with **close** and **far**, but those prepositions can’t be the force that makes the concepts expressed by those two roots relational. Other relational concepts that look irreducible include ‘lack’, ‘resemblance’, ‘ancestry’, ‘possession’, ‘content’, ‘inclusion’, ‘ability’, ‘clue’, ‘goal’, ‘difference’, ‘connection’, ‘advantage’, ‘preference’, and countless others. It is hard to see how those concepts could be decomposed into an

argumentless substantive core and a piece contributed by a well-motivated functional structure providing precisely the right kind of arguments in each case. While the program of rethinking the role of functional structure in the creation of what we used to think were basic lexical items is extremely promising and has already been successful in several areas (in particular adverbial modification, telicity, and the mass/count distinction⁷), I still have to see proof that even the toughest cases of relational concepts can be syntactically decomposed in the way proposed by Borer.

Relational concepts play an important role in research on the minds of animals. Hauser 2000 writes that Herrnstein, “who spent close to twenty years working on this problem, concluded that nonhuman animals have concepts, but not abstract relational concepts; important supporting evidence was obtained from studies of pigeons that failed to understand the relational concept of inside versus outside (Herrnstein et al. 1989).”⁸ However, Hauser reports on a study he himself conducted with two colleagues (Hauser, Kralik and Botto) exploring the presence of relational concepts ‘on’, ‘off’, ‘connected’, and ‘disconnected’ in cotton-top tamarins, small New-World monkeys. The study provided evidence for the presence of spatial relational concepts in the absence of human language. Relational categories in the social domain have been identified in primates. According to Tomasello 1999, “primates are selective in choosing their coalition partners, selecting as an ally, for instance, an individual who is dominant to their potential adversary – indicating their understanding of the relative dominance ranks of these two

⁷. Apart from Borer’s book, Marcin Morzycki’s program of Mediated Modification is most relevant here. Morzycki does in fact commit himself to concrete decompositions in the area of adverbial modification, and spells out what the proposed division of labor between substantive core and functional structure is. Morzycki (forthcoming).

⁸. Hauser 2000, 561.

individuals. They also seek retribution for attacks against themselves not just on the attacker, but also in some circumstances on the attacker's kin – in this case evidencing an understanding of third-party kinship relations. And there is even some evidence that primates understand whole categories of third-party social relationships across different individuals, for example, many different instances of the relationship “mother-child” ...⁹ Given that animals without human language are able to form at least certain kinds of relational concepts, it is rather implausible that humans should have to rely on the functional structure provided by their uniquely human language faculty to build such categories in the syntax. What is known about relational categories in human and non-human primates, then, seems to support the view that humans have at least some basic relational concepts that are not syntactically constructed. Unlike their primate cousins, however, humans are also able to build more complex relational concepts by syntactic means. A mixed source for relational concepts in humans fits well with the conclusions in a recent paper by Elizabeth Spelke: “What makes humans smart? According to the first answer, human intelligence depends on a biological endowment of species-specific, core knowledge systems. According to the second answer, human intelligence depends both on core knowledge systems that are shared by other animals and on a uniquely human combinatorial capacity that serves to conjoin these representations to create new systems of knowledge. The latter capacity, I suggest, is made possible by natural language, which provides the medium for combining the representations delivered by core knowledge systems. On the second view, therefore, human intelligence depends both on a set of core knowledge systems and on the

⁹. Tomasello 1999, 17.

human language faculty. Recent research on human infants, nonhuman primates, and human adults now seems to me to favor this view.”¹⁰

I take it then, that, in all likelihood, there are relational concepts that are carried by syntactic atoms without the help of functional structure. But as soon as you have relational concepts, you already have arguments. Not all argument structure is likely to be syntactically constructed, then, though I am ready to grant that a substantial part of it is. There is such a thing as initial, irreducible, transitivity, and we have to think about how to represent it. My proposal is that the semantics can do the job. If obligatorily transitive verb roots like **construct** denote relations between individuals and events, they have an individual and an event argument¹¹. The verb root’s denotation, then, is what makes it obligatorily transitive. There is no separate representation of argument structure. The root **construct** could then have the logical-conceptual representation given in (14):

(14) $\lambda x \lambda e \text{ construct}(x)(e)$

The format in (14) is a most economical way of representing the information that **construct** has an obligatory object denoting what is being constructed.

If all theme arguments were neo-Davidsonian in the syntax in the way Borer proposed, we would need some piece of functional structure that would be capable of accounting for the difference between **build** and **construct**. We

¹⁰ . Spelke 2003, 305.

¹¹ . This proposal might not hold up in the end. It might be that verbs of creation like **construct** denote relations between properties and events. This complication does not affect the point I want to make here, however. The verb’s denotation is what makes it obligatorily transitive.

would need some device that could formally mark obligatory transitivity.
There would have to be something that rules out (15):

(15) * **Nelly constructed.**

We might invoke a syntactic feature [transitive], to be checked against a matching feature of a direct object. If that object is to be neo-Davidsonian in the syntax, however, we still need a syntactic mechanism, a secondary predicate for example, to introduce it. Most importantly, we have to make sure that that syntactic mechanism introduces the right kind of object relation. As mentioned earlier, we have to exclude 16(b) and (c), for example:

- (16) a. **construct this barn** (effected patient)
 b. * **construct those plots** (affected patient)
 c. * **construct my yearly income** (consumed patient)

We also saw that we run into the same problem with **build**.

- (17) a. **build this barn** (effected patient)
 b. * **build those plots** (affected patient)
 c. * **build my yearly income** (consumed patient)

We have been granting that **build** is intransitive and that 17(a) is syntactically constructed. If both **construct** and **build** are intransitive, whatever excludes 17(b) and (c) should also exclude 16(b) and (c). But what is it that excludes 17(b) and (c)? 17(a) is a causative construction. As we will see in chapter 7, it is a concealed causative construction of a very general kind that is freely available with any intransitive verb. As far as 17(b) and (c) are concerned, we seem to be forced to the conclusion that there can be no

concealed syntactic mechanism introducing affected or consumed patients in a neo-Davidsonian way. There are no semantic reasons to exclude 17(b) or (c). In fact, we find verbs for building activities in German that have precisely that kind of direct objects:

- (18) a. **das Grundstück bebauen**
 the plot be-build
 ‘cover the plot by building’
 $\Box x \Box e$ [build(e) & cover (x)(e)]
- b. **das Geld verbauen**
 the money ver-build
 ‘use up the money by building’
 $\Box x \Box e$ [build(e) & use-up(x)(e)]

It seems, then, that the only way to exclude 17(b) and (c) in a theoretically satisfying way would be to say that the syntactic mechanism for adding the relevant kinds of objects is not available. It doesn’t exist. But this means trouble for the radical neo-Davidsonian. If all direct objects are neo-Davidsonian in the syntax, we would now predict that there couldn’t be any transitive verbs with affected or consumed patient arguments. This is very wrong. We already looked at a large collection of obligatory transitive verbs with affected patient objects, for example:

- (19) **Abduct, absorb, adjust, affect, amputate, arrest, attach, banish, buy, chase, check, clasp, clench, decorate, deport, dump, edit, educate, execute, feed, fix, grab, grasp, greet, harm, hurt, ignite, immerse, jar, jostle, jumble, kidnap, kill, label, loot, mail, maim, neglect, nip, occupy, operate, paralyze, pare, quench, record, recycle, slay, slice, sprain, squash, thrust, usher, veil, vend, wag, wreck,**

The story I am defending readily admits that there are affected or consumed patient arguments. What it denies is that they have to be neo-Davidsonian in the syntax. There doesn't seem to exist a freely available syntactic mechanism whose job is to introduce direct objects in a neo-Davidsonian way relying on general thematic relations like 'affected patient' or 'consumed patient'. Those relations do not seem to play a theoretical role in argument association.

Not surprisingly, the German verbs **bebauen** ('cover by building') and **verbauen** ('use up by building') are obligatorily transitive. The thematic role of their objects depends on the presence of the verb prefixes **be-** and **ver-**, but this dependence is non-compositional. Both prefixes are common transitivizers, but cannot be tied to affected or consumed patients consistently. Moreover, as the glosses for 18(a) and (b) make clear, the semantic contribution of the prefixes **be-** and **ver-** in connection with the verb **bauen** ('build') goes beyond merely contributing a general or only slightly more specialized thematic role. From a semantic point of view, German transitive prefix+verb compounds look more like largely non-compositional serial verb constructions. Two verbal meanings seem to be glued together, one of them already relational. This impression is confirmed when we inspect other compounds with **bauen**.

- (20) a. **die Scheune anbauen**
 the barn an-build
 'add the barn by building'
 $\square x \square e$ [build(e) & add(x)(e)]

- b. **das Haus umbauen**
 the house um-build
 ‘change the house by building’
 □x □e [build(e) & change(x)(e)]
- c. **den Speicher ausbauen**
 the attic aus-build
 ‘finish the attic by building’
 □x □e [build(e) & finish(x)(e)]

If the meanings of the verbal compounds in 20(a) to (c) are constructed from two more basic concepts, the component concepts are substantive, and most importantly, one is relational already. At the conceptual level, a property of events might have combined with a relation between individuals and events via Event Identification. The conceptual complexity of those verbs is still mirrored by their compound structure, but the conceptual atoms cannot generally be retrieved in a compositional way. The prefixes are mere pointers to a relational ingredient. They allow us to distinguish among the different object relations that are possible for a particular intransitive root, but they can't be said to denote any one of those relations. German has hundreds - if not thousands - of obligatorily transitive verbs that are built in this way, an utter nightmare for adult learners, who have to struggle with the subtle meaning differences thus conveyed. There are a lot of myths surrounding German verbal compounds: Myths trying to link their prefixes to telicity as in Slavic, myths trying to equip the prefixes with compositional meanings. True, there are productive pockets here and there, and there are some connections with telicity. But even a very superficial look at a dictionary will deliver a pervasive picture of non-compositionality defying any quick generalizations. This is typical of compounds. Interestingly, recent work by Gruber & Collins, Nishiyama, Cummings, and Collins has established a connection between verbal compounds and serial verb constructions in a

variety of languages¹². In the morphological literature, it is usually assumed that compounding does not involve functional structure¹³. Compounding joins roots or stems before they have had the opportunity to put on inflection. If that's so, the proposals of Collins, Gruber, Cummings and Nishiyama imply that even the syntactic addition of object arguments via serialization does not involve functional structure. William Snyder's work on the connection between the availability of resultative constructions and compounding (Snyder 2000) points to a similar conclusion. I will take up this important topic in chapter 7.

Returning to our English example, I conclude that while **build** is intransitive and its transitive uses are likely to be syntactically constructed, **construct** is already transitive when it enters the syntactic derivation. A host of other verbs should be, too - presumably all those listed in (19). To summarize, I have made a case against the assumption that all direct object arguments are neo-Davidsonian in the syntax. I first discredited the idea of a very general thematic role 'theme' by pointing out that it would lack cumulativity, an important property that other basic lexical items have. I then considered the possibility that direct object arguments might be introduced by less specialized, but still fairly general, thematic role predicates like 'effected patient', 'affected patient', and their kin. It turned out that some of those thematic role predicates express non-cumulative relations as well. Setting that problem aside, the assumption of neo-Davidsonian association with a whole repertoire of general direct object roles ran into an impasse when we started wondering how to ensure that verb roots would be connected to just

¹². Gruber & Collins 1997, Nishiyama 1998, Cummings 2001, and Collins 2002. But we would then have to wonder what it is that entitles a particle to adjoin to Voice.

¹³. This is not an entirely uncontroversial assumption. I will discuss (and defend) it in chapter 7. See Selkirk 1982 for what the main issues are.

the right kind of objects. Without any particular demands made by verb roots, we would expect many more transitivity alternations in natural languages than we do in fact observe. All verbs would start out intransitive, and would then be able to take a whole range of different kinds of objects. The verbs in (19), for example would be expected to allow all available object types in the repertoire, the only constraint being that no semantic inconsistency result. The vocabularies of natural languages do not seem to be constructed that way. The survey of English transitivity alternations given in Levin 1993 presents a very different picture, for example. In the following section, I will look at the major transitivity alternations in Levin's book from the point of view developed in this essay.

3.3 Transitivity alternations in Levin 1993: An agenda for theories of verb meanings

Some alternations classified as transitivity alternations by Levin would not come out as transitivity alternations on the present account. Those include the middle alternation illustrated in (21), and the causative/inchoative alternation illustrated in (22).

- (21) a. **The butcher cuts the meat.**
b. **The meat cuts easily.**

Levin 1993, 26.

- (22) a. **Janet broke the cup.**
b. **The cup broke.**

Levin 1993, 29.

The verbs in 22(a) and (b) are both built from a root expressing a relation between individuals and events. Such a root would be transitive from the

present point of view. It has a direct object argument denoting the thing that breaks. Crosslinguistically, roots of this kind are used to build unaccusatives or causatives, and that's what the alternation is about. The argument structure of the root **break** all by itself does not alternate in those constructions, assuming, as we do, that external arguments are not arguments of the verb root itself.

The middle alternation, too, seems to preserve the basic transitivity of the verb roots involved. This fact might be masked in English, but can be observed more clearly in the German translation of 21(b):

- (23) **Das Fleisch schneidet sich leicht.**
 The meat cuts itself easily.
 The meat cuts easily.

In (23), the direct object of the verb **schneiden** ('cut') is obligatorily represented as a reflexive pronoun. The subject of (23), then, does not realize the direct object of the verb, suggesting that the same situation might obtain in English, which would then have to be assumed to have an unpronounced reflexive pronoun in constructions like 21(b). The same difference between English and German shows up with respect to Levin's reflexive and reciprocal object alternations:

- (24) a. **Jill dressed herself hurriedly.**
 b. **Jill dressed hurriedly.**
 Levin 1993, 35.

- (25) a. **Anne met Cathy.**
 b. **Ann and Cathy met.**
 Levin 1993, 37.

German would have to use a reflexive pronoun in both 24(b) and 25(b). I will discuss middles and reflexives in chapter XXX. The phenomenon exemplified in Levin's middle, reflexive, and object alternations will be argued to be related to a voice alternation, hence to an alternation relating to external not internal arguments. The argument structure of verbal roots remains unaffected in those constructions.

More has to be said about roots like **cut**, however. **Cut** does have intransitive uses, as illustrated in 26(b). (26) is an example of the conative alternation.

- (26) a. **Margaret cut the bread.**
b. **Margaret cut at the bread.**

Levin 1993, 41.

The conative alternation is an alternation of the kind that is of great interest here. Isn't the bread an affected patient when you cut it? It is, but the example brings out a recurrent problem with the 'affected patient' role. It is still too general to be of practical use. If the bread is an affected patient of my cutting activity, so is the knife and the cutting board. If we could use the 'affected patient' relation for the neo-Davidsonian association of objects, we would expect the following unattested constructions, among many others:

- (27) a. * **Margaret cut the knife.**
'Margaret used the knife to cut something.'
b. * **Margaret cut the cutting board.**
'Mary cut something on the cutting board.'

Within the present framework of assumptions, we could consider the possibility that there are two transitive stems, **cut** and **cut at**, expressing two slightly different cutting relations. Or else there might be an intransitive verb root **cut**, and a corresponding transitive root that sounds the same because it has a zero affix attached to it functioning like a German prefix. Generalizations for related paradigms in English and other languages should help us choose the right option. Whatever the outcome may be, we see one more time that with actual transitivity alternations like the conative one, general thematic relations are of no help. The verb roots themselves ask for very specific object relations. Moreover, as in the case of **build** and **construct**, there are English verbs describing cutting activities that are obligatorily transitive. Among the non-alternating verbs Levin mentions, the following ones seem obligatorily transitive: **chop**, **crop**, **dice**, **mince**, **mow**, **prune**, **slice** and **slit**. Having to distinguish those from the alternating verbs **chip**, **clip**, **cut**, **saw**, **slash**, and **snip** seems to doom any theory advocating neo-Davidsonian association for all direct objects.

A related transitivity alternation is Levin's Locative Preposition Drop alternation illustrated in (28).

- (28) a. **Martha climbed up the mountain.**
b. **Martha climbed the mountain.**

Levin 1993, 43.

Here, German marks the contrast with an overt prefix, suggesting that English, too, might use a zero-prefix to mark the transitive alternant.

- (29) a. **Martha stieg auf den Berg.**
Martha climbed up the mountain.
- b. **Martha bestieg den Berg.**
Martha climbed the mountain.

The problems for neo-Davidsonian association are familiar by now. General thematic roles like ‘affected patient’ are too general to pick out the right kind of objects. When you climb a mountain, your boots and feet are affected, too. Yet we don’t climb our hiking boots or our tired feet. Consumed patients are not possible at all. Even though mountain climbing consumes a lot of energy, we do not climb a lot of energy. And so on. Here, too, alternating verbs contrast with non-alternating verbs that have closely related meanings. Levin mentions the alternating verbs **canter, climb, cross, fly, gallop, hike, jog, jump, leap, prowl, ramble, ride, roam, rove, row, run, shoot (rapids), stroll, swim, traipse, tramp, travel, trudge, vault, wade, walk, and wander**, which contrast with the following ones that only have intransitive uses: **bounce, drift, drop, float, glide, move, roll, slide, swing, spin, turn, twirl, whirl, wind**. In this case, then, a class of verbs that only has intransitive uses contrasts with one that has both transitive and intransitive uses. This seems to exclude neo-Davidsonian association for the transitive uses. If neo-Davidsonian association was responsible for the transitive uses of the first group, how could we prevent that very same mechanism from applying to the second group as well?

If all direct objects were neo-Davidsonian in the syntax, verbs could not exercise much control over their direct objects. Whatever control there was would have to be mediated by the event argument. As a consequence, the range of possible objects a verb can take would be much bigger than what we in fact observe. There is a crucial asymmetry between external and internal

arguments in this respect, then, that I will return to again and again in this essay.

So far, I have addressed neo-Davidsonian addition of direct objects in the syntax. What about logical-conceptual structure? If there is such a thing as logical-conceptual structure, we expect the cumulativity requirement to apply at that level as well. Consequently, there would be no logical-conceptual predicate ‘affected patient’, for example, that could introduce direct object arguments in a neo-Davidsonian way. Cumulativity would exclude that possibility. But what about logical-conceptual representations like the one in 30(b)? Are there any reasons to exclude 30(b) in favor of 30(a), for example?

- (30) a. $\Box x \Box e \text{ construct}(x)(e)$
 b. $\Box x \Box e [\text{construct}(e) \ \& \ \text{make}(x)(e)]$

In matters of logical-conceptual structure, the situation is rather unclear, and quite controversial. The logical-conceptual representations in 31(a) to (c), for example, capture the meanings of verbs all right, but to be honest, I really do not have the necessary evidence to justify the particular decompositions I posited.

- (31) a. **die Scheune anbauen**
 the barn an-build
 ‘add the barn by building’
 $\Box x \Box e [\text{build}(e) \ \& \ \text{add}(x)(e)]$
- b. **das Haus umbauen**
 the house um-build
 ‘change the house by building’
 $\Box x \Box e [\text{build}(e) \ \& \ \text{change}(x)(e)]$

- c. **den Speicher ausbauen**
 the attic aus-build
 ‘finish the attic by building’
 $\lambda x \lambda e$ [build(e) & finish(x)(e)]

As mentioned in chapter 1, we may wonder whether there is any genuine lexical decomposition at logical-conceptual structure at all, that is, decomposition that is not matched by parallel decomposition in the syntax. In a series of publications since 1970, Jerry Fodor and Fodor and Lepore have criticized standard arguments that allegedly support lexical decomposition¹⁴. Hale and Keyser’s lexical theory reduces all decomposition to syntactic decomposition¹⁵. In the interest of learnability, we expect the relationship between the syntactic representations of lexical items and their logical-conceptual counterparts to be highly constrained, and in the best of all possible worlds, the two representations would match completely. For my current project, I do not have to try to resolve the issue. Argument association in the syntax is what I am primarily interested in, and here, we have at least some evidence suggesting that direct objects are not introduced by a general thematic role predicate ‘theme’, nor by any of the slightly less general thematic role predicates found in common thematic role inventories.

My strategy for discrediting the theme relation relied on cumulativity, a property that emerged as a possible universal for the denotations of simple transitive verbs and thematic role predicates. Cumulativity as a constraint on basic predicative meanings is an important topic all by itself, even though, in this chapter, I have primarily used it as ammunition against a thematic

14. Fodor 1970, Fodor and Lepore 1998 and other references cited there.

15. Hale and Keyser 1993, 1999.

role predicate ‘theme’. In the following chapter, I will supplement the anecdotal evidence for cumulativity that I have given so far with an in-depth theoretical evaluation. This evaluation will take us far into the semantics of plurals and distributivity. If only the status of the theme relation was at stake, such an excursion might very well be too time consuming and costly. Since my case against the theme relation is at the same time a case for a powerful universal restricting the range of possible basic verb meanings, however, the excursion will be well worth its money in the end.